

TKI*
E39
v.39

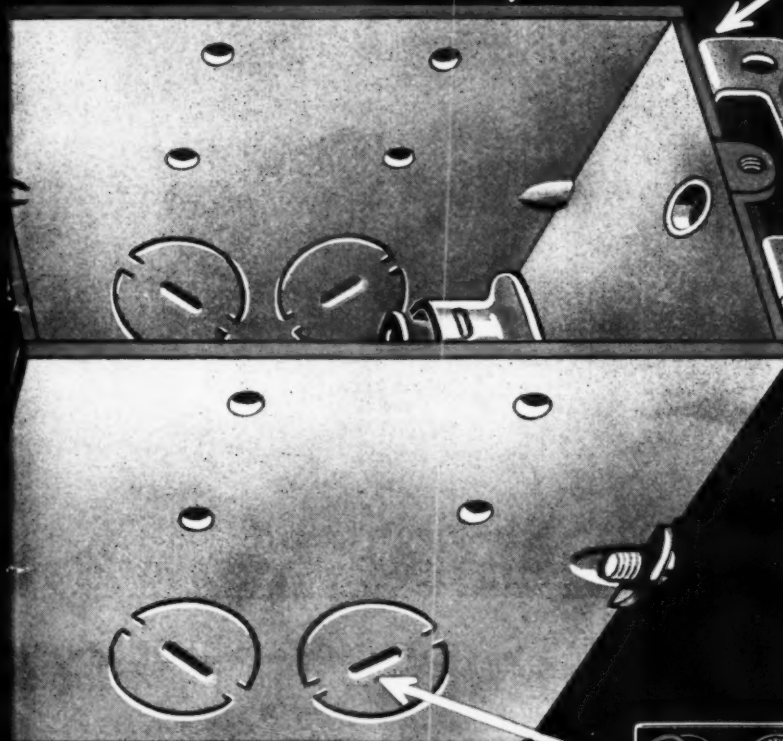
Electrical Contracting

December 1934

With Which Is Consolidated
The Electragist and Electrical Record

National Nos. 7 & 12 SWITCH BOXES

Redegee
AN IDENTIFICATION OF
A STANDARD OF QUALITY



Swivel Ear
above box edge level-
proper position

Raised Rib
gives strength-prevents
bending or distortion

Swivel
for old work
no small screws
for big fingers

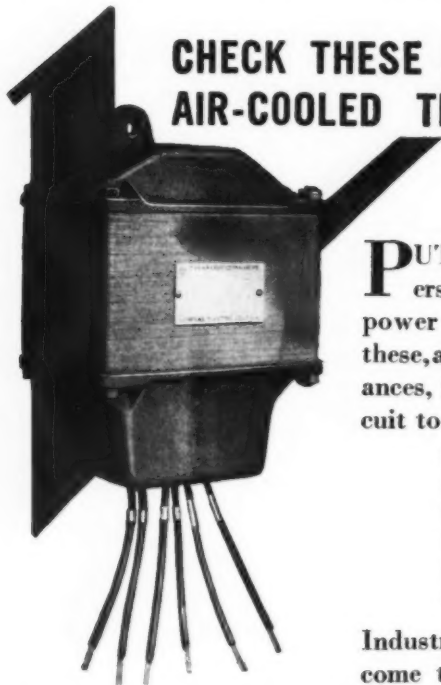
Proper Height
for flush mounting
of switch plate

U. S. Patent Nos.
1,369,083 1,808,050
1,822,128 1,861,807
1,941,997 1,944,707

National Electric
PRODUCTS CORPORATION
SUBSIDIARY PHELPS DODGE CORPORATION Pittsburgh, Pa.



GET YOUR SHARE OF THIS PROFITABLE BUSINESS



CHECK THESE JOBS FOR G-E AIR-COOLED TRANSFORMERS

PUT all of your customers' power load on the power circuit. Transfer these, and similar shop appliances, from the lighting circuit to the power circuit:

- Small drills
- Compressors
- Vacuum cleaners
- Fans
- Soldering irons
- Gluepots

Industrial plants will welcome the savings that can

be made by installing small G-E air-cooled transformers for these jobs.

You'll also find profitable installations for these transformers wherever less than standard voltage is required for the operation of:

Portable lamps and tools	Signal lamps
Bells and buzzers	Lamps subject to vibration
Annunciators	Airport boundary lights
Motion-picture projectors	

Remember, G-E air-cooled transformers have many other applications for economy and safety. Now is the time to cash in on this new business.



G-E TIME SWITCHES Are Easier to Sell Easier to Wire And They Stay Sold

INSTALL G-E time switches and you will find that you have no expensive service calls to wind clocks, set time, lubricate bearings, and free sticky contacts. They are simply constructed, for long life with freedom from petty troubles.

Their readily accessible terminal board and their convenient knock-outs make wiring unusually simple.

There is a wide variety of applications for G-E time switches. Start cashing in on the profitable business they offer, by ordering one of them now. Install it and forget it.

GENERAL ELECTRIC

LET us tell you more about G-E time switches and transformers. Simply mail the attached coupon, or address the nearest G-E sales office, the G-E Supply Corporation, or the Graybar Electric Company, Incorporated.

General Electric Company
Dept. 6B-201, Schenectady, N. Y.

Time Switches ☐

Air-cooled
Transformers ☐

Please send me descriptive and application data on the products I have checked above.

Name.....

Firm.....

Street.....

City..... State.....

320-43



VOLUME 34
NUMBER 2

electrical contracting

WITH WHICH IS CONSOLIDATED ELECTRICAL RECORD
S. B. WILLIAMS, EDITOR AND GENERAL MANAGER

PUBLISHED MONTHLY
BY
ELECTRICAL TRADE
PUBLISHING
COMPANY
HOWARD EHRlich, PRESIDENT

CHICAGO
520 NORTH MICHIGAN AVE.
WHITEHALL 7900

NEW YORK
330 WEST 42ND ST.
MED. 3-0700

CLEVELAND
GUARDIAN BLDG.
MAIN 3981

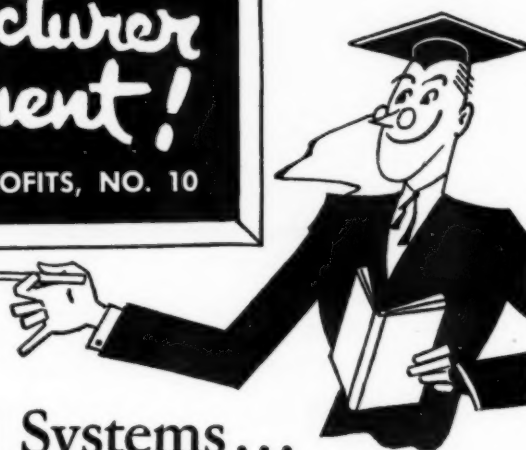
CONTENTS FOR DECEMBER, 1934

John Wise	5
Public Demonstrations	6
Apartment House Service Modernization.....	8
Why Should an Apartment House-Owner In- stall a New Service?.....	9
Combining Lighting and Heating Fixtures for Large Areas	10
A Remodeled Electrical Home.....	12
Good Will Necessary to Build Alteration Vol- ume by F. J. Seiler.....	13
Display Striking Comparisons in Wiring Meth- ods	14
Office Methods for the Motor Repair Shop....	15
Amusement Place Wiring Offers Moderniza- tion Opportunities	17
Editorials	18
Code Chats	20
Code Authority News.....	26
Contracting News	30
Practical Methods	36
Manufacturers News	41
Index to Advertisers.....	44

ENTERED AS SECOND CLASS MATTER NOVEMBER 14, 1928,
AT THE POST OFFICE AT CHICAGO, ILLINOIS, UNDER
THE ACT OF MARCH 3, 1879. COPYRIGHT, 1934, BY THE
ELECTRICAL TRADE PUBLISHING COMPANY. YEARLY SUB-
SCRIPTION: UNITED STATES, \$2.00; FOREIGN, \$2.50; CAN-
ADA, \$3.00, INCLUDING DUTY. SINGLE COPIES, 20 CENTS.



MEMBER AUDIT BUREAU OF
CIRCULATIONS AND NA-
TIONAL PUBLISHERS' ASSO-
CIATION. ALSO PUBLISHERS
OF ELECTRICAL WHOLESAL-
ING AND MILL SUPPLIES.



RCA VICTOR Sound Systems...

The Profitable Solution to *Any* Sound Problem

SINCE March, the Professor has appeared on this page to call your attention to the double barreled profit for you in the sale and installation of RCA Victor Sound Equipment.

We have indicated by example, that any sound job from a church to a restaurant is a tailor-made situation for RCA Victor Equipment. We have told you of some of our many products... our Centralized Radio for schools and hotels... our Antenaplex for apartment houses... our Public Address Equipment, portable and permanent, for auditoriums, dance halls, restaurants and every conceivable place where people gather to hear.

Many a progressive electrical contractor has tied in with us in this drive... and the result has been profitable to him and to us. Backed by the integrity and world-wide reputation of RCA Victor...selling equipment for every conceivable purpose at the right prices...the wide-awake contractors have had tangible realization of our promise of the famous "double barreled profit"... sale and installation.

Summing up the year... let us again urge your entrance into this profitable field... once more reminding you that we stand ready to aid you in every way both from the sales and engineering standpoint.



RCA VICTOR



RCA VICTOR CO., INC., ONE UNIT OF RADIO CORPORATION OF AMERICA... THE WORLD'S LARGEST RADIO ORGANIZATION. OTHER UNITS: NATIONAL BROADCASTING CO., INC. ... B. C. A. COMMUNICATIONS, INC. ... RCA RADIOTRON CO., INC. ... RADIOMARINE CORPORATION OF AMERICA.

Ask for information about RCA Victor equipment for any kind of sound job.

RCA Victor Sound Systems are available for every conceivable purpose. Write for information about any or all of the following to RCA Victor Co., Inc., Camden, N. J.

Name _____
Address _____
City _____ State _____

- ☐ Centralized Radio
☐ Sound Reenforcing
☐ Simplified Antenna Systems
☐ Public Address

Lost Opportunities

HARDLY a month goes by but what the electrical industry is losing opportunities for business promotion because of the lack of some central bureau that has that responsibility.

THERE was recently opened in New York City under national auspices, and with a complete program of broadcasts on a national hook-up, a model home. It was the intention of the sponsors to build a home within a budget and to have it complete and modern. From the standpoint of a great many phases of house construction, it was the last word, but when it came to the wiring it was as usual "a last word," which means that it was done with out plan.

The industry has an adequacy wiring standard which had it been followed in this home would have been brought to the attention of the nation by radio and by articles in general magazines and newspapers. A central promotional bureau would have made every effort to have the wiring in this home adequate.

The Federal Housing Administration is eager to have help and suggestion, and will do its utmost to cooperate with any branch of the building industry that shows it is alert. What has the electrical industry done to work with F.H.A.? When we look at the publicity releases we find electrical wiring mentioned but in a way that shows very definitely that F.H.A. has had little coaching from the electrical industry.

A national woman's publication has been remodeling homes in a number of cities setting up each as a model. The electrical modernization (?) was left to be spotted as the work went along.

Where the government is making an effort to encourage the use of electricity through low rates and low prices on appliances we find no effort by the industry to sell adequate wiring.

One government agency that is planning rural de-

velopments is eager to have information and help but on electrical matters there is no central industry bureau to advise it.

There are numerous other examples that can be cited each involving a lost opportunity; but these will serve to show the situation.

In addition to such opportunities as just cited there are besides opportunities within our own industry that could be brought forward by some body that could get all interests together at one time.

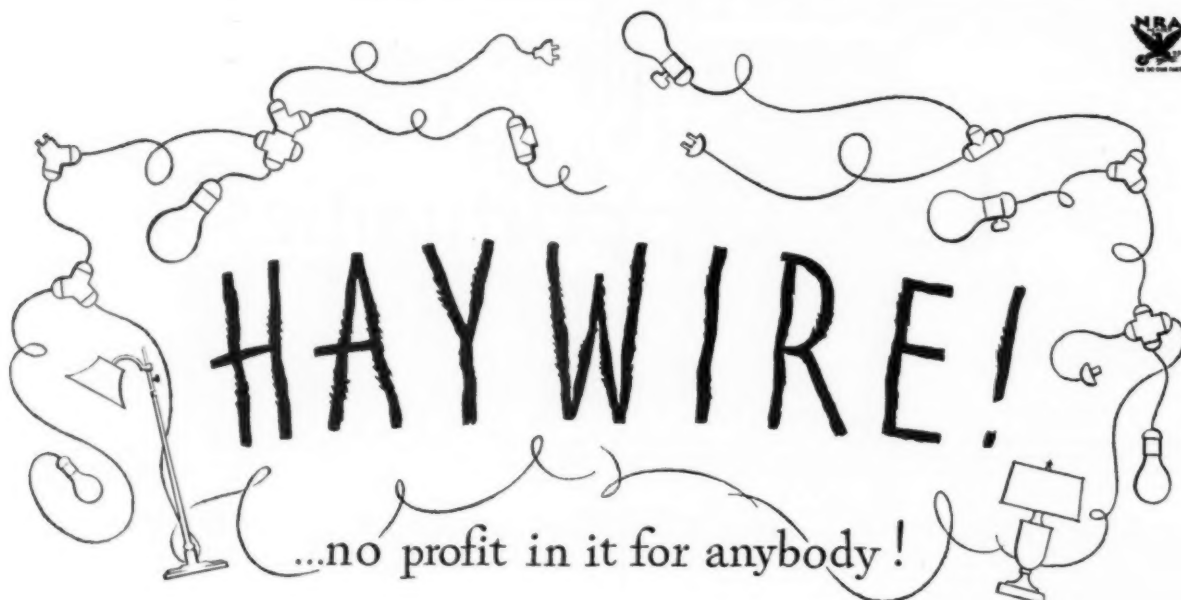
There is the opportunity of range wiring, installation of outdoor metering, promotion of adequate wiring in old buildings, reinspection, etc. All of these mean more business, and greatly increased employment in the manufacturing, wholesaling, inspecting and contracting divisions of the industry, as well as more business or economies to the utilities.

Their promotion needs a central agency.

ELECTRICAL CONTRACTING realizes that the Society for Electrical Development which was organized to do just these things was abandoned by the industry only a short while ago. ELECTRICAL CONTRACTING also recognizes, however, that the Society was abandoned not because it was wrong in principle but because it was so organized that it could not function as desired.

The Society was exceptionally expensive but a central agency need not be so costly. With certain reservations, of course, it can spend as much or as little as desired.

There are undoubtedly many men in the industry who, too, feel the need for such an agency but who feel that time has had to elapse after the demise of the Society to gracefully forget it. Hasn't that time now elapsed? Must we continue to pass up golden opportunities—just when we need them so badly?



Half a dozen household appliances on a single overloaded circuit. Double and triple sockets. Strange gadgets and make-shifts.

Has the Great American Home gone completely haywire?

It looks that way—in all too many cases. Contractors who have looked around know what a surprisingly large number of otherwise modern homes contain antiquated, haywire electrical installations.

What has happened? Who is to blame? Not the home owner. The electrical contractor? Partly, but not entirely. The big bad depression? Only partly.

Strange to say, the biggest cause of wiring inadequacy today is—*progress*! Progress has gotten ahead of home wiring.

One by one, new electrical appliances, new electrical conveniences have found their way into homes—*because people wanted them*. They are going to want more in the future. They want to keep up-to-date.

Result—the wiring installation that was ample to carry the load ten, or even five years ago, is inadequate today. The average home electrical load has grown enormously.

Never has the electrical contractor found himself face to face with a greater, more clear-cut opportunity. Reports from every side indicate the public is in more of a buying mood than at any time in years. But the public will not and can not buy wiring by itself. It must be shown—and sold. And it's up to the electrical contractor to do the selling.

Hint—it isn't hard to find an excuse to look at wiring in homes in your vicinity. Offer an inspection as a free service. You may be surprised to find yourself far more welcome than you expected.

Step two. Note the serious inadequacies, the inconveniences—possibly even, the electrical hazards—that may be present. Call them to the attention of the home owner. Sell him. But sell him convenience, comfort, safety—not just wire and outlets.

Step three. Don't stop there. You may know of lots of electrical improvements, new ideas, new conveniences and comforts. But, the chances are, your customer has never heard of them. Educate him. Bring him up to date. Tell him about built-in appliances, better lighting, future possibilities in all-year air condi-

tioning. Tell him—and sell him!

And when you do, sell him a quality job that won't come back to reproach you later. (If you can sell a "cheap" job, you can sell a quality job.) It will pay.

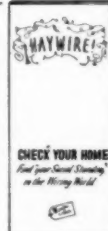
To Contractors who see their opportunity, and who are ready to go out and grasp it, Graybar offers its wholehearted support. Some of that support is represented by the dependability of electrical materials from Graybar. Let Graybar's 65 year old reputation for quality stand behind your own business reputation.



Graybar
ELECTRIC COMPANY
OFFICES IN 74 PRINCIPAL CITIES

Contractors! You'll want to see this interesting booklet that describes home check-up suggestions in detail. We have a plan for distributing imprinted copies to your customers. Your name below brings you the details.

GRAYBAR ELECTRIC CO.
Room 1501, 420 Lexington
Avenue, New York City



EC 12-34

Name.....

Address.....

VOLUME 34
NUMBER 2

electrical contracting

DECEMBER
1934

WITH WHICH IS CONSOLIDATED ELECTRICAL RECORD



Away down in Dixie a National League scout watched a young college pitcher bending them over the plate for dear old Simpson. The kid had the kind of stuff that drives batters crazy, blinding speed, change of pace and a flock of beautiful curves.

Highly impressed, the scout sent for the phenom and asked him if he would like to play with the big league team. "Sure," was the cool reply, "for \$3000." The scout gasped; in those days most rookies would have been glad to sign for cakes and ale, to get into the majors and Mr. Scout said as much. The lad stood pat. "Times have changed, Mister," he said, "The old spavins are wearing out, this year's crop of youngsters is small; I'm the best of the crop, so it's \$3000 or no dice."

"Tell you what, kid," said the scout, "I'll pay your expenses up North and back, we'll try you out, and if you can show our hitters the same stuff you dished out today, three thousand it is." But when they reported to the home grounds the manager balked at the salary. Then he had an idea. Calling in the catcher who was to handle the lad's shoots, he told him to work the boy with signals and tip off each batter as to what kind of a pitch was coming. "Then they'll hit him hard," finished the manager, "and we'll be able to

cut him down to maybe \$1000."

The catcher tipped off the batters as directed, and all the poor rookie pitcher could do was to strike out nine straight men, including the last year's champion and five .300 batters. The flabbergasted catcher, after having the wind knocked out of him several times, received a frantic wig-wag from the manager: "Get that maniac out of there before he wants \$5000!" So they rushed the rookie to the office and signed him in a hurry.

Today we contractors must get ours as this kid did, in the face of strong arguments and obstacles. The Federal Housing Administration will cause the building of thousands of houses over the country. We must go after those jobs with the idea of selling installations in keeping with the times—not the kind we were held down to formerly. This is going to take plenty of

courage as well as salesmanship.

An installation costing 2 per cent of the total residence figure may have been sufficient eight or nine years ago, at present it falls far short of a reasonable ratio. The kind of living we are doing demands more electrical conveniences and more adequate wiring, and every contractor should get out and go the limit in selling more of his work in these new homes.

Public Demonstrations

- (1) Reduce amateur and bootleg wiring.**
- (2) Win public over to reinspection.**
- (3) Improve acceptance of safe electrical devices.**

A PUBLIC educational program devoted to electrical safety and fire prevention work has been carried on for two years in Kenosha, Wis. Actual demonstrations of cord abuses, fuse troubles, electrical fire and explosion causes have been performed during this time before practically every local organization of men, women and youths. This work has caused the people of Kenosha to become more cautious in the selection and safe use of cords, fuses and other electrical items, while amateur and bootleg wiring has also been greatly curtailed.

The degree of general interest aroused by this activity is evident from the report that as many as twelve voluntary electrical reinspection requests have been received from persons attending one electrical safety and fire prevention demonstration. Three hundred and twenty-eight electrical permits for the correction of reinspected premises were issued in Kenosha during the first nine months of 1934. This in a city of 57,000 population and claiming to have about 10,500 structures in all classes. Public resistance to the reinspection reports and correction orders is claimed to be greatly reduced, since the electrical inspector has become established in their minds as an authority on electrical safety and fire prevention matters, through his frequent public appearances before them.

"Let the public see for themselves," says George Morzfeld, Kenosha's electrical inspector, and also head of

the fire prevention department. The public, is, therefore, given a close-up demonstration and lecture, which includes the overloading and ignition of conductor insulation, fuse blowout tests, gasoline vapor and dust explosions. At the conclusion of each program a discussion period is arranged at which time many important questions concerning further safety details are asked by interested persons.

In order that all may have a plain view of the equipment and materials in use, a table six to eight feet long is placed before the audience, upon which horrible examples of frayed or sub-standard cords, tampered fuses, etc., are placed in readiness for demonstration. An assortment of current consuming devices, such as range elements, toasters, irons and hotplates are provided, each with its own cord connection. These units are plugged into sample outlets upon a miniature residence wiring system display board, thus making it possible to build up definitely known wattage loads to explain the principle of overloaded and overfused circuits.

A glass showcase about 42 in. long, 24 in. wide and 30 in. deep provides the explosion chamber for generating therein the visible gasoline vapors and explosive dust particles. This case is tightly fitted, with wood bottom and ends, while it is open at the top. A mesh reinforced sheet asbestos cover is laid upon the top to provide a tight enclosure, yet with this asbestos lid being free to blow off when an explosion occurs. A lamp socket in the base of the explosion chamber is equipped with an



George Morzfeld (right), Kenosha, Wis. electrical inspector and William M. Peterson, secretary of the Fire Department, who conduct the safety demonstrations.

externally operable carpenter's compression clamp for breaking a burning bulb and igniting the settling vapors. A perforated funnel and hose extension provides the means of blowing explosive dust particles about the case near a lighted candle. A 6 ft. piece of tin guttering is slanted downward from an aperture in the case with a lighted candle placed at the lower extreme end of the gutter. The vapors may be seen to seek the low end of the gutter after emerging from the cabinet until they are ignited by the candle flame. Then a flash-back occurs to the interior of cabinet, with the resultant explosion.

In order that laymen may clearly understand the sequence and elementary purposes of the electrical system, an interconnected ply-wood panel is arranged for setting on the demonstration table. This panel has mounted thereon—

- 1—A main service switch of the externally operated fusible type, with main current connections representing the service conductors.
- 2—A fuse block representing one of several panelboard branch circuits—"Your electrical safety valves."

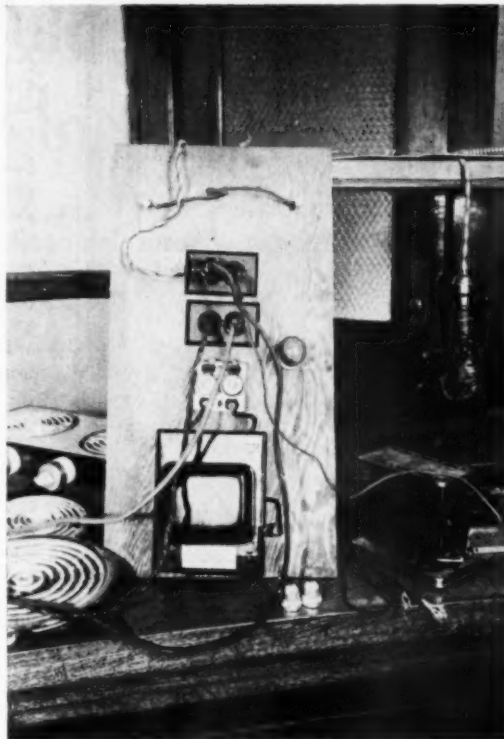
Electrical Contracting, December, 1934

- 3—Two duplex convenience outlets representing various household outlets, to which various connected loads and defective cords are attached during the course of demonstrations.
- 4—A red pilot light which burns while circuit is "on" and goes out with fuse blow-out.

In order to acquaint the layman with the complete story of the better and safer use of electricity, a step-by-step procedure of explanation and demonstration is followed in its logical sequence. This is summarized about as follows:

1—Principles of fuse protection:

1. Plain overload tests by the actual plugging-in of an excessive number of current consuming devices.
 2. Fuse function under short circuits.
 3. Explanation of 15 amp. fuses and hexagon window identification.
 4. Doctored fuses, showing conductor destruction and insulation ignition while pennied, stripped or plugged fuses are used.
 5. Inferior or non-approved fuse blowout demonstration with standard cotton blow-out test, in comparison with approved fuses.
 6. Principle of current carrying conductor and heating of copper.
- 2—Approved cord demonstration:
1. Elements of improperly made splices.
 - (a) Ignition of tape wrapping on loose connections.
 - (b) Visible arcing of loose splice while conductor is being flexed or vibrated.
 - (c) Destruction of conductor strands in blowout test.
 - (d) Explanation of stranded conductors and make-up.
 2. Examples of breakdown on actual non-approved cord. Samples used were removed from local reinspections.
 - (a) Breakdowns at attachment plugs.



With this equipment the public is shown how the service switch controls the service conductors, also the reason and functions of branch circuit fuses. The open plug fuse block protects two convenience outlets directly above. Some of the loads which are plugged in on this panel may be seen on both sides. A pilot light ceases to burn when the fuses are blown. The panel is shown resting against the end of explosion chamber.

- (b) Breakdowns along conductor at worn spots or kinks in proximity to combustible materials.
- (c) Examples of breakdowns while subjected to excessive moisture.
3. Demonstration of specific types of labeled cords and explanation of identified bracelet label.
4. Explanation of restricted intent of cord usage—wiring methods.
- 3—Exposure of combustible materials to—
 1. Burning lamps.
 2. Toasters and other heating elements.
 3. Electric irons.
- 4—Samples of improperly insulated sockets, extension sets and explanation of shock hazards.
- 5—Hazardous locations:
 1. Ignition of gasoline vapors (with a mild resultant explosion) by

breaking a burning lamp bulb in the midst of vapors.

2. Demonstration of visible downward travel of escaping gasoline vapors to a fixed flame and their flash-back to cause an explosion within the vaporizing chamber.
3. Ignition of explosive dust particles in explosion chamber.
- 6—Demonstrations of non-electrical fires, static ignition of cleaning fluids, spontaneous combustion, etc.
- 7—General fire prevention warnings — carelessness, etc.

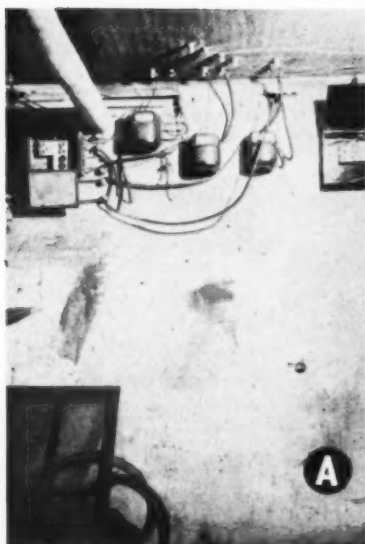
Some of the organizations interested in fire prevention demonstration and which have cooperated as a result of this education work are:

Boy Scouts
Public Schools (above the 6th grade)
High Schools
Civic and commercial groups
Men's Clubs in Churches
Women's Clubs in Churches
Parent-Teachers' Association
American Legion Posts and Auxiliaries
Fraternal Organizations
Industrial Employee Clubs
Factory Foremen Clubs
Stationary Engineers
Public school janitors
Building Industry group
City Firemen

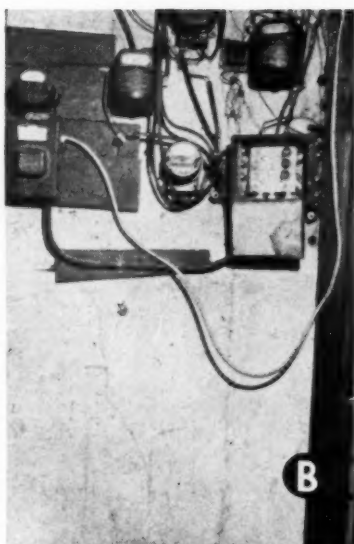
Mr. Morzfeld reports the receipt of requests from neighboring communities for this safety demonstration. Due to the amount of equipment required to be transported to properly "put on the show" and the time required for a complete demonstration, such requests cannot all be fulfilled without a considerable sacrifice of time now devoted to local efforts.

Other electrical inspection departments which desire to arrange similar programs in their communities can provide similar equipment at small expense and in all probability can secure the material from the local trade.

The Kenosha educational plan is considered a success, and it is predicted that the results obtained there will go far in minimizing electrical hazards through the cooperation of an enlightened public.



A



B



C



D

Awaiting modernization

A—An apartment house meter switch group in which new construction has already been started. Note new sub-main fuse cabinet at upper right.

B—A meter center for which a modernization contract has already been awarded, subsequent to reinspection citation.

C—A group of switches which are being replaced, also new sub-mains and new service entrance equipment are included in a general modernization.

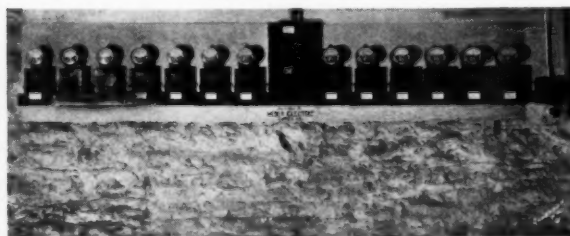
D—Part of a 20-apartment meter center upon wall opposite janitor's sink and gas range. Branch circuits are pennied. This apartment is adjacent to a large ward school building. Reinspection efforts have made a sizeable modernization job of this hazardous condition, as many violations also are cited within the apartments.

Apartment House Service Modernization

After modernization

(Left) A 26-family apartment meter bank modernizing example, employing automatic circuit breakers for reducing fuse tampering hazards. This installation replaced a very hazardous and obsolete installation.

(Below) A good example showing the recent modernization of a 12-apartment meter bank.



Why Should an Apartment House-Owner Install a New Service?

New services and meter distribution centers are needed in a large percentage of apartments and flats in order to provide their tenants with safe and adequate current supplying facilities for the many devices now in use. This modernization market is evident by a review of such structures which were built prior to and during the apartment house boom up to 1929. A resume of the possible sales points to promote business in this field is given here so that the contractor may cite the facts to owners of such property.—Editor.

A—Inadequate Capacity:

1. Old installations were made prior to the present day values of current consumption.
2. Boom day construction was largely speculative, therefore—
 - (a) Work was done for low prices at minimum adequacy standards.
 - (b) "Flatting" contractors demanded speedy production often at the sacrifice of high-grade workmanship and short-cut methods.
3. Higher saturation through the development of appliances, lighting equipment and auxiliary devices brought increased loads such as:
 - (a) Refrigeration.
 - (b) Kitchenette cabinets.
 - (c) Cooking devices.
 - (d) Sun lamps and kindred electro-therapy.
 - (e) Vibrators and exercisers, physio-therapy.
 - (f) Washing and ironing equipment.
 - (g) Auxiliary heating devices—warming pads, etc.
 - (h) Miscellaneous lighting portables for higher wattage consumption.
 - (i) General public service equipment—radio—ice water—new heating equipment.
4. Increased depression period occupancy factor:
 - (a) Popularity of bridge.
 - (b) Curtailment of night-club and dining-out customs.
 - (c) Decline in new motor car sales—more staying-at-home nights.
 - (d) Increased reading habits as evidenced by sharp upturn in public and lending library circulation data.
 - (e) Greater economy in laundry bills—more home washing and ironing.

B—Obsolescence—Deterioration:

1. Corrosion of conduit—fittings—metal enclosures and supports through exposure to (1) weather, (2) condensation, (3) seepage or (4) corrosive gases or fumes.
2. Conductor insulation deteriorated from:
 - (a) Heat—from overloads or proximity to excessive temperature.
 - (b) Abrasion—in installation, unsupported raceways or fittings, altered position in distribution cabinets.
 - (c) Exposure to oil or other injurious agents.
3. Loose conduits and ground conducting connections.
4. Poor electrical contacts, burned off or blackened due to lack of maintenance.
5. Exposure to grit or harmful dust accumulations in locations such as boiler rooms.
6. System may not be arranged for best metering scheme to receive lowest energy rate.

C—Hazardous Conditions:

1. Alterations to structure which leave service equipment difficult of access by firemen.
2. "Bootleg" wiring alterations by inexperienced wiremen.
3. The molestation and "botching-up" of existing wires and cables by careless trouble-shooters and janitors.
4. Profusion of tangled wires in contact with live current carrying parts within distribution enclosures.
5. Loosened or broken ground conducting path.



Main Combination Lighting-Heating-Air Conditioning Unit

Combining Lighting and Heating Fixtures for Large Areas

IN designing for Minneapolis, Minn., what is claimed to be the first completely year-round air conditioned U. S. Post Office, the equipment for lighting, heating and summer-cooling its immense main lobby was incorporated into one combination fixture of unusual proportions. This ornamental bronze assembly, which is reported to be the largest ever built, is 355 ft. in length and

weighs over sixteen tons. It includes a steel supporting framework which extends up through the suspended lobby ceiling, to concrete beams in the upper floor construction.

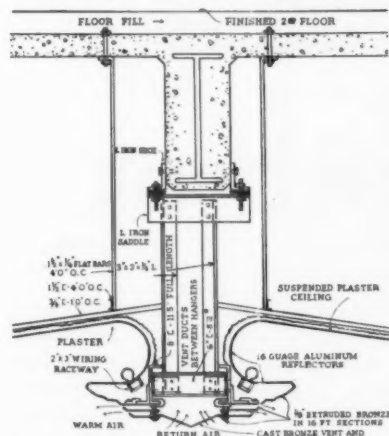
Except for the stamped grille work which is provided at uniform centers in the bottom portion of this huge bronze fixture for return air ducts, its striking appearance is solely that of a modernistic indirect lighting unit.

Twenty-nine k.w. in 50-watt lamps will be consumed at about $4\frac{1}{2}$ -watts per square foot for the indirect illumination of the 6624 sq. ft. of space comprising the 368 ft. long and 18 ft. wide main post-office lobby.

There are two rows of flush reflector sockets on about 16 in. centers, for its entire length. These outlets are alternately controlled by twenty-four branch lighting circuits, evenly di-

vided between two panelboards near the opposite ends of the main lobby. Twelve home run conduits, each for two circuits were stubbed down into the fixture from the floor slab above, at regular intervals. These were connected with 3 in. by 2 in. wiring raceways which were attached to the inner surface of the continuous reflecting troughs of this fixture. No. 12 slow burning wire was used in the raceways.

In daring to create such a radical departure from previous methods or equipment for government buildings, Magney & Tusler, Inc., sole architects and engineers for this two and a half million dollar building project, followed sound principles of engineering throughout. Air conditioning problems had been studied by this firm over a period of years, while the heating and lighting technique was submitted to associated experts before



Details of end elevation and supports a pleasing combination of ornamental and efficient design was finally adopted.

A structural or supporting framework was planned, which could be assembled and erected by the steel workers independently of later operations. Within this framework a series of conduits, warm air ducts and return ducts were stubbed downward by the respective contractors to fit into the respective collars of similar ducts which were to be a part of the fixture design. Suspended plastered ceilings were then constructed in such contour as would be most suitable for light diffusion, and also to form a lengthwise enclosing beam or collar so as to fit snugly to the upper part of the fixture which was yet to be assembled.

The fixture itself was next assem-

bled, by attachment in 16 ft. sections to the steel framework. Extruded ornamental bronze plates of $\frac{1}{8}$ in. thickness and weighing over 22,000 pounds in all were attached step-by-step, together with the carefully designed sections of interior air ducts, dampers and louvers, until the final operation consisted of the attachment of the sectional reflector sheets and wiring raceways.

Wide sweep reflector troughing of 18 ga. polished aluminum was designed in shapes to fit into the extruded sides of this fixture. Punchings for 50-watt lamp sockets and raceway supporting screws were pro-

vided in these troughs, therefore the wiring of each 16 ft. section was done on the job before being placed in the fixture.

The wiring and installation of this equipment was done by the Sterling Electric Company of Minneapolis.

Only eleven states enforce the ASA Industrial Lighting Code, or its equivalent, according to a survey made by E. J. Poor, chairman of the Hygrade Sylvania Corporation. Six states reported an inadequate code and of the rest of the states none reported a code at present, although two are working on one.

Herald Tribune Home Institute

Play Safe with Fire Risks

If You Use It Properly, Electricity Is the Safest Mechanical Servant You Could Hope For. But When Husband Plays "Handy Man" and Bridges the Fuses So They Won't Blow Out So Often, You Are Inviting Trouble. Wives Are Culprits, Too, When They Overload a Wire

By T. Alfred Fleming
National Board of Fire Underwriters




Over five hundred thousand homes have been damaged by fire in the last five years. In this time, more than 175,000 homes have been destroyed. This is a constant menace to the nation, the family, and the individual.

This was made apparent by a study of nearly 1,000 cases of electrical fires in the last five years. Of a total of 175,000 cases, more than 175,000 were caused by either improper installation or by unregulated extension and alteration to existing equipment.

In another city a three-day check-up of homes by a single inspector resulted in the collection of these points of danger from the above four million worth of premises and statistics taken from domestic fire losses. In view of our recent flooding fire which, burned two children to death and was eventually traced to a bridge plug, the value of this reporter's diagram becomes obvious.

The trouble is that most of us take electricity for granted because, when better known, it is the most dangerous servant we have ever had. But that does not mean the truth that ignorance and neglect can easily convert it into a fire menace of almost gravity, and when we come to analyze the records carefully, we find that this danger results in far more needless deaths than is generally admitted.

This means something to the average householder because, first, he and his wife are to blame for much of the trouble and, second, because the trouble is difficult to remedy. The husband's responsibility usually rests in his reputation of "handy man" about the house and his willingness to undertake any ordinary electrical job with an experience which can not easily be called in question. He is, in reality, the culprit responsible for the

fire. When the first safety rule is made to compare with your fuse and not to insert fuses larger than those originally put in by a competent electrician. If fuses blow regularly, have a licensed man go over the installation to determine and remove the cause. In addition, when alterations or extensions have to be made by an existing system, and in a qualified electrician and let him do it. He knows what it is all about, as is evidenced by the fact that less than 5 per cent of our electrical accidents occur in wiring that has been done in accordance with the National Electrical Code and approved by the underwriter.

But it's not only on the inside. There is no denying the fact that lay will have equal responsibility for electrical accidents. Housewife knows their line on how their 15 per cent of all these fires are started by the dangerous electric iron. Modern fires are equipped with thermostatic controls which prevent this danger, but old-fashioned ones usually don't possess this safeguard. The consequence is that the old electric iron is more apt to set fire to the clothes than a double, a telephone or a lamp to set the housewife away from the stove. Having the iron ignored. An iron left on a burner and left to about ten minutes.

Another mistake of the housewife—and this is the one which is frequently made either deliberately or by accident—is the practice of overloading the circuit, especially that one serving the kitchen and dining room. In older houses, built before the modern wave of electrical servants, wiring is often not heavy enough to bear much abuse and the combination of several circuits on the same circuit may easily result in a fire.

The National Electrical Code, formulated by the Fire Underwriters' Association, says, for example, that on the typical household 15-ampere branch circuit, devices shall not be used "having a rating exceeding 10 amperes at 120 volts." It goes on to say: "Such a circuit may supply lighting outlets, receptacle outlets, or permanently connected appliances."

Continued on page 11

Feeding the Family Economically

In a season of rising food prices you will find our booklet, "Economic Dining," well worth consulting. The full edition, which was issued first a year ago and re-edited, contains menus and recipes for any fall week. They are based on foods that are plentiful and inexpensive then. To get it include twenty cents in stamps when you write for it to the Home Institute, 230 West Forty-first Street, New York City.

NEEDED PUBLIC EDUCATION: A full page from the Sunday magazine section of the New York Herald-Tribune of October 7. More public education of this nature is necessary to prevent tampering with the wiring by the lay householder.



A Remodeled Electrical Home

A FEW years back when new house construction was going along at top speed one of the recognized ways of interesting the public in adequate wiring, lighting and appliancing of a home was to build a model electrical home. Today with more emphasis on remodeling than on new building the Marietta (Ohio) Electrical Association, in cooperation with the Monongahela West Penn Public Service Company, have remodeled their city's most famous old home and thrown it open to the public as "Marietta's Home of Today."

The old Putnam home completed in 1805 by General Putnam's son is today the last word of electrical convenience in Marietta. The house was opened to the public on July 13 and by the time it was closed on November 1, more than twelve thousand people had passed through it.

Particular emphasis was placed upon the wiring features, many of which were brand new to most of the visitors to the house. Thoroughly instructed guides told visitors the

"whys and wherefores" of the wiring and the meaning thereof in living comfort.

Before remodeling there were six circuits, four lighting and two appliance, on a 30-amp. main switch. Today there are fifteen lighting circuits and five appliance circuits, on a 100-amp. residential main switch. The service is No. 2 wire, and branch circuits (lighting) are No. 12. The appliance circuits, two to the laundry, one for air-conditioning, one for range and one for attic ventilation, vary in size from No. 10 to No. 6. All circuits are protected through circuit-breaker load centers and the load is balanced.

Garden lighting and safety lighting have their own circuits, and controls. The safety lighting, four deep bowl, angle type reflectors with 75-watt lamps, placed under the eaves and controlled by a switch from the master bedroom have evinced a great deal of favorable comment.

In the kitchen, recessed ceiling fixtures over the sink and other work-

ing surfaces have met with approval. A 3-circuit ceiling fixture in the dining room, built-in lighting in the side and top panels of the front entrance, and built-in indirect lighting over the bookcases have all been well received.

In the living room, equipped with eight convenience outlets, 50 percent of the outlets are controlled from wall switches at the entrances, making it possible to control the decorative portable lighting equipment upon entering or leaving the room. The wall brackets and mantel torchieres are also controlled by wall switches at the entrances.

An ultra-violet ceiling fixture, wall switch controlled, is installed in each bathroom.

An illuminated house number, made by cutting out a box above the door frame, installing a metal box, and fronting with opal glass, takes care of the house number problem.

In all rooms there is maintained a division of circuits, so that a circuit breaker outage in one circuit will not throw the entire room in darkness.

Electrical Contracting, December, 1934

Good Will Necessary to Build Alteration Volume

by F. J. Seiler
Assistant Editor
Electrical Contracting

ONE very important factor in the development of a successful modernization and repair business in addition to the adjustment of one's organization to that type of work and the proper training of workmen is customer goodwill. Because of the expense in soliciting this type of work, particularly the smaller jobs, and because of the infrequency of repeat business, it is essential that the contractor depend, to a considerable extent, for leads and new customers upon the word-of-mouth advertising of old customers.

It is not enough that a contractor do his work well and without complaint. He should try, in addition, to inject a personality into his work and should try to sell his customer during the progress of the work so that the customer feels that he is getting exceptionally good treatment and is getting more than he is paying for.

The approach to modernization work is different than the approach to new work. Except for very large projects modernization work in most cases is handled entirely between the contractor and the customer without the intervention of a third party such as an architect or general builder. In new work one competes very largely on the basis of price, while in modernization work this is much less a

Some Things to Know		
Residences and Apartments	Commercial Work	Industrial Work
The F.H.A. Plan Adequate Wiring Standards Ventilating unit designs Range and water heaters Refrigerators Special domestic rates Modern refixturing Stokers, oil burners The better-cord movement Red Seal Standards Logical places for replacing wiring hazards Current consumption for minor domestic devices	Better Light—Better Sight movement Air-conditioning equipment Ventilators and blowers Show window design Industry adequacy standards Show case wiring devices Floodlighting methods Signs and decorative units Signal systems Time switches and flashers Flexible systems, under-floor and exposed wiring	Specific plant operations Power factor economies Industrial lighting Belts, pulleys, gears Motor characteristics Auto transformers Industrial heaters Maintenance problems Motor control devices Electronics Structural and millwright methods Private sub-station advantages and costs

factor. In new work the element of time, particularly in connection with the operations of other trades, is important. In modernization work, while this same element of time frequently does exist, it is not so important.

Because of the fact that modernization and repair work is so frequently done at the same time that the customer is occupying the premises, there is a tremendous amount of direct customer contact. Courtesy, willingness to serve and evident desire to be of as little nuisance as possible, little extra touches or a clever bit of lighting, or control, or installation flexibility are the things that help to build customer goodwill. Because this extra effort to please is so valuable in the creation of goodwill every member of the contractor's organization that can possibly come in contact with the customer should be carefully chosen from this point of view.

Wiremen particularly should be encouraged to sell through the approach of suggestions for increased electrical service.

It is not enough merely to have the desire to sell. It is essential that the staff members thoroughly understand what they are talking about. The men on residential work, for instance, should be specialists on that class of work, while the men on commercial work should know that phase and the men on industrial work should understand how to give better service in factories. Some of the things that staff men should know in each of these particular fields are listed at the top of this page.

While goodwill can be created by the little extra touch, it can be very quickly killed by carelessness. To enjoy friendly public relations, and thus build lasting goodwill, intelligent selling methods and good service must go hand-in-hand toward

Customers' Complaints		
Workmanship	Charges	Inexperience
Inefficiency. Workmen disputes or misconduct. Wasted time—material. Incompleteness, omissions, faulty methods. Inadequacy, skinning the job. Structural damage or defacement. Breakage or soiled customer property. Interferences or delays to customer. Errors in locating outlets or runs.	Excessive rates—labor or material. Billing errors—quantities extensions, totals. Under-estimated "outside" figures. Vague terms of payment provoke misunderstandings. Salvage material allowances. Changes in layouts not confirmed. Extras and omissions not settled on beforehand. Exchanges and credits. Excessive overtime costs. Unnecessary drayage.	Code or utility rule violations. Poor electrical or mechanical design. Errors in ordering special materials. Inadequate equipment for the type of job. Lack of electrical knowledge. Misjudging length of shutdowns. Poor taste in selecting ornamental designs. Failure to anticipate future demands or the flexibility for alterations.

**Direct
Goodwill Builders**

1. Tactful credit arrangements.
2. Definite or adequate quotations.
3. Consistent business and price policy.
4. Furnishing the right man for every job.
5. Courteous and capable solicitors.
6. Knack of applying the most suitable layout.
7. Safeguarding of customer against liability or interruptions.
8. Careful restoration of disarranged premises.
9. Punctuality in starting and completing work. Avoidance of pulling men away to other jobs.
10. Supplying other dependable services through connections with other reliable sub-contractors.

minimizing customer complaints. While complaints may often seem to be unfounded, a majority are provoked through something which is lacking in the organization or management of the contractor's business. Since the very nature of modernization work is in itself conducive to complaints, an analysis of the factors which provoke them is in order. It is generally agreed that the principal causes for complaints involve (1) workmanship, (2) customer charges and (3) inexperienced or lax management. Under each of these three principal sources are numerous causes which bear study. The use of every possible means for their prevention is necessary in any plan to build up better public relations.

**Indirect
Goodwill Builders**

1. Accurate invoices and accounts.
2. Prompt and concise estimates.
3. Simple yet definite contract forms.
4. Systematic material purchasing procedure.
5. A fair profit which permits good service.
6. Efficient methods and facilities for small job management.
7. Cooperation with utility service department for neat equipment.
8. Friendly and truthful employee reports of complaints.
9. Timely advertising literature on modernization suggestions.
10. Friendly cooperative inspector relations to assure prompt service.

DISPLAY STRIKING COMPARISONS IN WIRING METHODS

It is estimated that about 21,000 people viewed a wiring hazard display board that was recently exhibited at Hamburg, N. Y., during the Erie County Fair. The exhibit was arranged to demonstrate that adequacy in correct wiring methods goes hand in hand with safety. It is reported that the greater interest was shown by the public in examining examples of defective wiring and makeshift methods.

A two panel display board was de-

wiring methods, including examples of range and water heater wiring systems. All groups or single objects of importance were explained by small printed signs or cards which were placed adjacent thereto.

Some of the wordings on explanatory signs and upon the display board read as follows:

Approved fixtures are easily applied and are safe.

Adequate wiring eliminates alterations, but when wiring must be ex-



The public showed great interest in this display at Erie County Fair

signed and equipped by the Erie County Volunteer Firemen's Association, with the assistance of the Buffalo office of the Niagara Hudson Power System. The panel at the left displayed defective materials and hazardous methods, including open splices, bridged fuses in circuits of telephone wire and frayed cords, also some examples of incomplete conduit work. This panel included a hinged album containing a series of mounted photographs of defective and hazardous wiring installations which were reproduced from photographs supplied from the files of ELECTRICAL CONTRACTING. The panel at the right consisted of various examples of correct

tended, use approved and safe methods.

Use approved porcelain or similar type of insulated fixtures for bathroom, kitchen and basement.

The sponsors of this exhibit claim to be rewarded for the efforts put forth due to the desirable reaction from those who viewed this display.

Fire loss in New York City due to "spray hood" fires dropped from \$88,000 in 1918 to \$150 in 1934. This drop is attributed by O. E. Smith, chairman of the fire and accident committee of the Eastern Section, I.A.E.E., to Article 32 which was written in the Code in 1920.

Electrical Contracting, December, 1934

1—Job Cost Record, 2—Job Cost Recap, 3—Job Record Sheet (front), 4—Numbered Invoice, 5—Shop Material Form, 6—Shop Labor Form.

Office Methods for the Motor Repair Shop

THE cost of doing business by a motor repair shop embraces several important factors, namely: (1) Shop equipment, (2) stock investment, (3) building facilities and (4) office methods. An expanding scope of operations, such as has gradually taken place with the Boustead Electric & Manufacturing Company of Minneapolis, Minn., has necessitated the development of an efficient system for office procedure.

This firm handles all types of electrical machinery repairs, the design and construction of special switchboards, special machine work, the

sale of new and used apparatus and also a large supply business with other repair service shops in magnet wires, fibre, etc.

The quantity and nature of office routine that would, therefore, evolve from such a business demands a smooth working system of limited overhead expense that will:

1. Adapt itself to a widely diversified scope of repair service activities, in both small and large operations.
2. Provide accurate control of work done (a) in the shop, (b) about the city and (c) out of town.
3. Permit the handling of apparatus sales without a separate system of records.
4. Lend itself economically to low-margin motor repair material sales to other repair shops.
5. Provide definite and concise cost records for each transaction with a minimum amount of clerical operations.
6. Permit accurate inventory control but with minimum stock room requisitioning routine.
7. Allow shop foreman job control without the usual soiling or blurring of important detail entries.

Electrical Contracting, December, 1934

8. Constitute speedy yet comprehensive invoicing details.
9. Hold down clerical expense without sacrificing the completeness of job information.
10. Minimize job record filing space.

Shop Material Forms

Items of petty material, such as glue, varnish, twine, etc., are approximated by the shop foreman and a lump sum total cost is assigned to the job under the term "Budget Materials." The more important material items and stock parts are listed by the stockroom clerks upon a 4 in. by 6 in. ruled form, which is printed on blue paper. This form includes columns thereon for the office to compute the cost of each item. Deductions from perpetual inventory stock records are also posted from this form. Each blue form represents a lump sum total cost to be posted in one entry to job record sheet.

Shop Labor Form

Each shop mechanic fills out daily a separate labor form for each job worked on. This form is 4 in. by 6 in. and is printed on white paper. Rulings are provided for four periods of work upon an individual job in one day, which is considered the maximum that is likely to occur. Space is also provided for total hours, rate and cost extensions and clerical posting initials.

Job Records

The total cost of each job is recorded in recap form upon a 5 in. by 8 in. white paper form. A similar salmon colored form covers the detailed cost of labor, workman expense items and drayage, as posted thereon from shop labor forms. Each of these forms have identical rulings upon their front sides. The back of the office recap form is arranged for having office postings made thereon of the various material tickets, and the total labor cost and workman expense taken from the completed labor sheet. Special expense items then comprise the total job cost.

The job cost record forms are kept in visible index type files while work is in progress. The small labor and material forms are slipped in the back space, behind the job record form. On large jobs where a large number of labor or material items are involved, a separate folder or file pocket is used.

Upon the completion of a job, the material and labor tickets are clipped together and filed according to job number in standard 4 by 6 card filing cabinets. The job cost record forms are then used as the basis for billing, and are attached to and filed with the billing copy of the completed invoice.

Billing Methods

Work done on open order, which constitutes a major part of this company's repair business is billed by lump sum only. Details of material used or labor totals are not carried on the customer invoice. A plain description of the work and the total charge for same comprises the full extent of this phase of billing.

The total cost of stock materials is marked up for lump sum sale price in one pricing operation upon the reverse side of the job record sheet. In addition, a handling charge of 10 cents is made for each separate item of material involved in the order. Special parts or apparatus are priced

out in columns especially provided on the back side of the job record sheet, while labor is extended at prevailing charges.

A triplicate invoice form of the continuous roll type is employed. This form is 9 in. wide and 7 in. long, is numbered consecutively and is perforated for detachment from the roll after typing operations are completed. The customer's copy is white, while a salmon duplicate constitutes the shipping and billing copy. A yellow triplicate is used for a job record or audit copy.

All job numbers are assigned from invoice numbers, therefore, as soon as a new job is commenced, its triplicate set of invoice forms is reserved awaiting job completion. The completed shipping and billing copy of invoice is filed alphabetically according to customer's name, together with job cost records, while the audit copy of the invoice is filed numerically. Thus a check-back may be made either by the customer's name or by job number.

ELECTRICAL FIRES IN CHICAGO

The loss in the city of Chicago due to fires of electrical origin in 1933 was \$173,335 and the lives of three adults.

In the report of the electrical inspection department there were 651 fires of electrical origin. There were also 52 fires of unknown but possible electrical origin, the loss on which amounted to \$101,570.

The report shows that the largest number of electrical fires were caused by improper installation including tampering by the incompetent. While appliance fires were second they were closely followed by fires caused by

motor and other winding failures and by failure to replace worn out equipment. The figures follow:

Occupancies in Which Fires of Electrical Origin Occurred

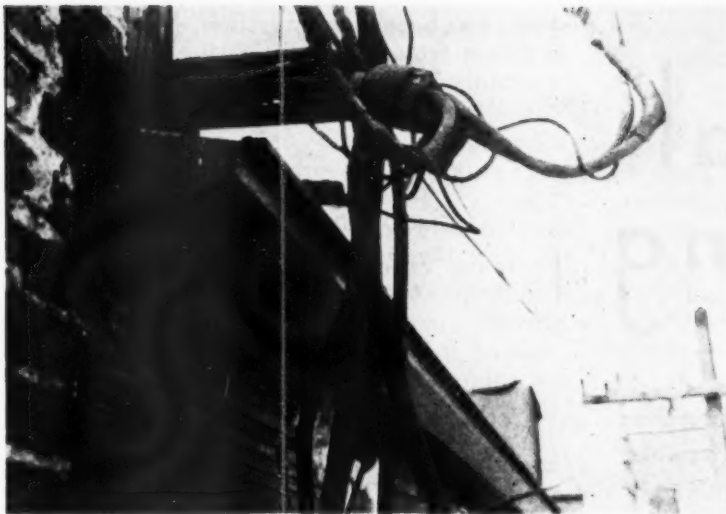
	No. of Fires
Residence	441
Hotel	11
Office	12
Store	125
Factory	31
Garage	9
Gas Station	10
Miscellaneous	12
Total	651

Analysis of Fires of Electrical Origins

	No. of Fires
(a) Improper installation including tampering by the incompetent.....	160
(b) Failure to provide approved enclosure, guard or pilot lamp.....	45
(c) *Overloading or overfusing	0
(d) *Failure to replace or repair equipment injured or worn out in service....	109
(e) *Failure to keep clean, dry or handle with care.....	38
(f) *Manufacture defective	2
(g) *Electrical origin; details of cause unknown.....	40
(h) Motor and other winding failures.....	110
(i) Electrically heated appliances or devices including lamps left in circuit, unattended, in contact or too close to combustible material. (No code violations.)	116
(j) Ignition of inflammable materials being used temporarily in the vicinity of electrical equipment. (No code violations.).....	5
(k) *Storms: usual occurrences or conditions.....	26
Total	651

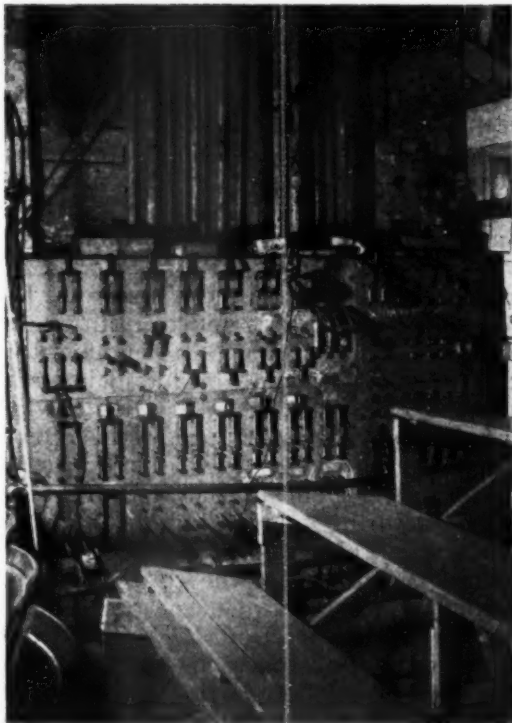
*Motor and other winding fires not included.

Electrical Contracting, December, 1934

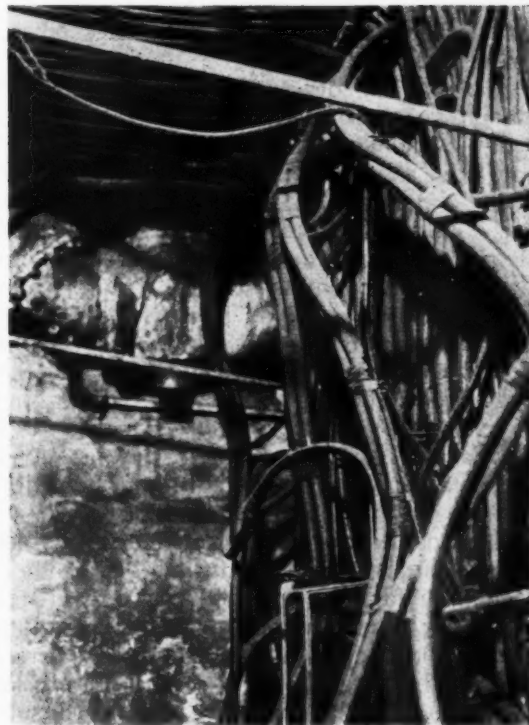


A group of service entrances found in a suburban theatre before modernization. Although 1½ in. lighting service conduit is completely rusted away from its terminal fitting this was in daily use. Note ¾ in. conduit laid on gutter with taped end for emergency service.

Amusement Place Wiring Offers Modernization Opportunities



A back-stage scene in an old theatre which plays to capacity crowds when staging important wrestling or boxing events. Choice seats in wings of temporary construction as in foreground are built up to the old switchboard guard rail. This is a serious panic hazard which needs correction.



Rear view of a large switchboard in a public hall which seats 14,000 people. A nice mess for a lively insulation blaze. A big job for modernization.

electrical contracting

With which is consolidated Electrical Record

S. B. WILLIAMS, Editor

THE FIRST FIVE YEARS

WE have now finished five years of the depression. They say the first five years are the hardest and they must be right.

It has been a struggle. Less than half of the contractors who started with us in the fall of 1929 are now in business. Some new ones have started up but on the whole not so many.

Those who have survived have learned to live on a smaller volume. Costs of doing business are not as high as they were. Consequently with a Code of Fair Competition in operation any increase in business should prove profitable.

During the depression, and particularly during the past year or so, a great many contractors have accepted conditions as they are and have adjusted the character of their business accordingly. Thus we find erstwhile big building contractors soliciting small work, some contractors taking on merchandising lines such as stokers, others going into the manufacturing business.

It is obvious from a survey we recently completed that there is a decided tendency today for a contractor to engage in all kinds of electrical wiring. Where formerly residential wiring was confined very largely to the smaller operators, it is today being done pretty generally by all classes.

This condition of adapting one's business to the times will undoubtedly continue in 1935. In fact, if the F.H.A. program does stimulate house construction in the volume contemplated it is quite possible that a number of the larger contractors will actively enter into the competition for this class of work.

All in all, this year of 1934 has been an improvement over 1933. There is more stability to the contracting business today than

there has been for some time. We are a long way yet from being out of the woods, but it certainly looks at last as though we were rapidly on our way.

REMODELED ELECTRICAL HOMES

IN many cities through F.H.A. committee activities homes have been modernized and thrown open for public inspection, but it remained for the Marietta, Ohio, contractors to remodel an old home electrically and show it as a model electrical home.

We can all of us remember how thousands would line up to go through an electrical home back in the days when we were building houses. Today when the market is modernization we might well afford to turn back to that successful means of publicity.

The people must be made to want modern electrical convenience and one of the best ways to create that want is to show them the modern ways. We look forward to seeing more model electrically modernized homes.

DISCOUNTS

THE membership of the N. E. C. A. has been advised of a number of manufacturing companies which have submitted price schedules that give the electrical contractor a preferential discount. Many more have just missed measuring up to the principles of distribution as stated by the N. E. C. A. Allowance of the contractor's discount, or larger, to governmentals and to utilities on contractor material keeps a number of schedules from receiving the association's approval.

The efforts of the association in this direction are bearing fruit, and it is anticipated that before long a substantial percentage of the manufacturing companies will be doing what they have always professed to want to do, namely, compensate the contractor for his selling.

In the opposite direction, however, comes the new discount sheets of the motor manufacturers wherein the margin of the dealer is smaller, and in many cases has disappeared. While it is fairly obvious that these new discounts are aimed at competitive practices between manufacturer, it is doubtful if the companies that enjoyed a nice dealer distribution can afford to jeopardize that business with inadequate discounts.

It is true that many so-called motor agents do not create any business but that is no reason why their sins should be visited upon the dealers that do sell. Of course, a number of the smaller motor manufacturers have not been vitally interested because they have had virtually no dealers. They would like to have dealers and could have them were a different kind of dealer policy set up within the industry. Here is something else that requires study both by the manufacturers and the contractors.

THE CODE WORKS

SOME most encouraging figures on the success of the Electrical Contractors' Code of Fair Competition will be found in the Code Authority News section of this issue. Up to the middle of October 81 percent of all the complaints were handled by the local administrative committees without recourse to compliance boards.

This is a wonderful record of a self governing industry. It demonstrates clearly how effective a code can become if rightly administered.

There have been many contractors who have been discouraged over what seemed to them to be lack of compliance. To those contractors we offer these facts as evidence of accomplished compliance. Unfortunately, business in general in thinking of a code lost sight of the fact that it is impossible to completely alter the habits of an industry overnight by law. It takes time to adjust ourselves to conditions.

Moreover, the administration of codes is new. Business men have had to be trained to act in local administrative capacities and frequently this training was by people equally new to the conditions. To be able to accomplish the amount of compliance indicated by the figures is, therefore, doubly encouraging.

And besides even if we are having some compliance problems, how much that we are accomplishing would we have were there no code? Let us not lose sight of the gains. Before we had a code contractors were at the mercy of both the buyers of their services and their competitors. In fact competitive conditions were such that one frequently wondered whether it was not more profitable to lose business than to get business.

It is evident, of course, that these condi-

tions have not been entirely rectified, but it is equally evident that competitive conditions are vastly better than they were a year ago. In some places there has been no change because there is no local administration committee. Until a community is organized it can, of course, not expect the same degree of compliance as a place that is organized. All in all, however, the electrical contracting industry has made its code work. As time goes on it will work even better.

MORE ABOUT RANGE WIRING

THE electric range manufacturers are making plans to sell at least 200,000 ranges in 1935. This is more ranges than were ever before sold in one year. T.V.A., lower rates, lower-priced ranges together are opening a rapidly growing market for electric cooking.

In all of the range promotion the price of wiring has been considered to be of major importance. If it was important when ranges cost from \$150 to \$200 or more, how much more important is it when ranges cost from \$60 and up!

Range wiring prices ranging from \$30 to \$100 will be found today and they will be all right under the conditions they were quoted. However, the higher prices can be lowered materially and a good job done, and the contractor will be better off.

It requires a different procedure from that now followed. In the first place, it should be possible to agree on some simple, safe standards for range wiring. Much of the cost is due to extravagant local requirements. In the second place, it is not going to be possible to lower range wiring costs materially except the jobs be done on a quantity basis. If every job is to be estimated and bid for separately the prices will have to stay up. On the other hand, if a certain few contractors in each city can be given all of the range wiring business they can train their men and so adjust their operations that a maximum efficiency will result.

Quantity production with specialists plus simple standard hookups are the only ways in which range wiring prices can be lowered without greatly impairing the quality and safety of the job.

Why cannot the contractors, utilities, manufacturers and inspectors through their national associations work this out?

\\ code chats ///

A MONTHLY DISCUSSION OF WIRING PRACTICE AND QUESTIONS OF INTERPRETATION, PRESENTED WITH A VIEW TOWARD ENCOURAGING A BETTER UNDERSTANDING OF THE NATIONAL ELECTRICAL CODE

CONDUCTED BY F. N. M. SQUIRES
CHIEF INSPECTOR, N. Y. BOARD OF FIRE UNDERWRITERS

SEPARATE SERVICE FOR GARAGE?

In wiring a private garage in the rear of a residence does the Code require a separate circuit and a separate service switch? The garage is on the rear of the lot and is fed from the house meter.

The Code requires a switch to control the garage circuit but this does not have to be of the service entrance type. This switch may be any type of approved switch and this may be where the wires enter the garage or may be further back on the line.

Nor is a separate circuit required provided the circuit is not overloaded.

USE OF SERVICE CABLES FOR FEEDERS

Can feeders run underground be type AEIC service cable as covered by card No. 380-E as file No. E9198? If so, may this cable be run in earth without additional protection, or must it be enclosed in rigid conduit?

Can feeders run underground be interlock type service entrance cable and may they be buried directly in earth or must they be protected with conduit?

Most inspection departments allow the use of service entrance cable for feeder or circuit wiring with certain modifications.

For instance, while in service cables the neutral may be bare the type of cable having such a bare neutral would not be permitted for feeder or circuit work. Otherwise the cable approved for use underground could be used buried directly in the ground without conduit, while the unprotected type approved only for use above ground would not be permitted.

The initials and numbers referred

to by our correspondent do not seem to appear as given on the Laboratories' cards but the above answer probably sufficiently answers the questions.

CONTROL WIRES FOR OIL BURNER

The thermostatically operated control circuit of an oil burner is supplied from a bell ringing transformer. Can these wires be in the same conduit as the motor circuit wires?

If the insulation of the control circuit wires is of the 0-600 volt class the wires may be in the same conduit.

If, however, the wires of the control circuit are of the bell or annunciator type they must be kept away from the power or lighting circuit conductors.

Bell wires have given so much trouble in the past that their use is rapidly disappearing. Their use should be strongly discouraged and the use of protected conductors with 600 volt insulation encouraged.

SOCKETS IN GARAGES

Is it a violation to use brass shell key or pull chain sockets in garages?

There has been considerable confusion over this matter. Because of the presence of gasoline and gasoline vapors, many consider garages to be hazardous locations and believe that explosion proof materials and construction should be used.

The Code, however, recognizes the fact that gasoline vapors are much heavier than air and that these vapors settle toward the floor.

Garages, therefore, are controlled by Article 33 rather than by Article

32. Article 33 provides that in garages for more than two cars only armored clad wiring shall be used, while in one or two car garages any type of approved wiring may be employed. Article 33 further provides that cutouts, switches, receptacles, sockets (except on portables), if within 4 ft. of the floor, shall be of explosion-proof type, but if over 4 ft. above the floor may be of any approved type.

Hence, brass shell key or pull-chain sockets may be installed in garages providing they are more than 4 ft. above the floor. For portables only keyless, not brass shell, shall be used.

COMMON NEUTRAL

In an apartment building the meters are all placed in the basement. A double branch cutout is placed in each apartment. The load, however, on each of the two circuits in each apartment is very small and will not overload a 2-wire No. 14 feed from the meter to the apartment.

It is found that instead of running a 2-wire feed to each apartment it is more economical to run a 3-wire feed to take care of each two apartments. The service is 3-phase 4-wire. Is this a violation?

If properly connected the above arrangement would be permitted. The two apartments on each 3-wire feeder should not be connected on the same phase of the service. If both apartments were connected to the same phase and the load exceeded 7½ amp. per circuit or more than 15 amp. per apartment, the neutral wire of the feed would be overloaded. But by connecting each of the two apart-

Electrical Contracting, December, 1934

Greater Switching Capacity Smaller Size Unequaled Simplicity

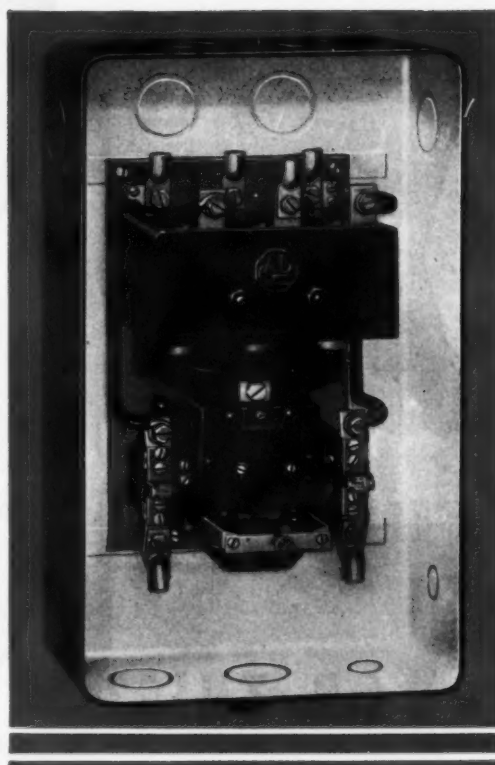
That's the

NEW BULLETIN 709 SOLENOID STARTER

It's in a class by itself! All engineers who have seen the new line marvel that such tremendous switching capacity has been attained in a switch so compact. Ten times maximum rated current at listed voltage is easily disrupted. This has been accomplished by using solenoid-operated mechanisms.

There are no flexible shunts and the double-break silver alloy contacts require no maintenance. The straight-line motion prevents accidental closure of switch from jars and jolts. And pick-up and drop-out voltages are low: pick-up 70%; drop-out 50% of line voltage.

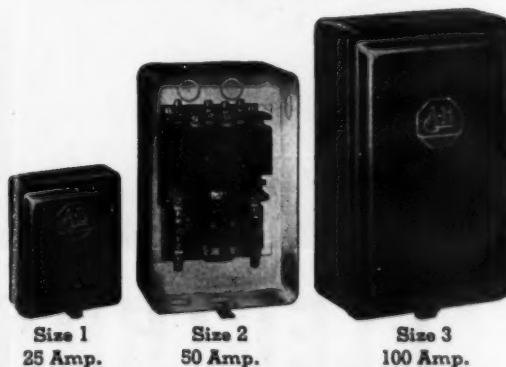
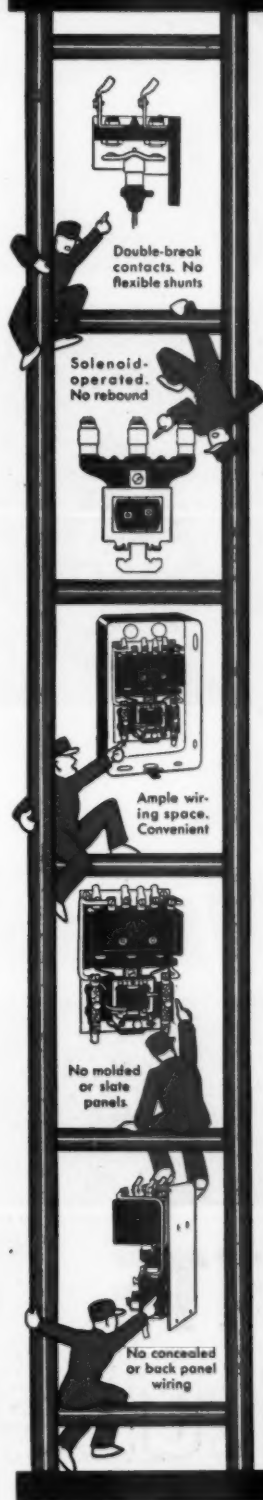
ALLEN-BRADLEY CO.
1307 S. First St., Milwaukee, Wis.



There is generous room for wiring. All connections are accessible from the front of the switch. Slate and molded panels are eliminated. The switch mechanisms are self-insulated and can be mounted directly on machine bases without extra insulation.

The white Reflexo-finish of cabinet interiors reflects light and facilitates wiring in dark corners.

The symmetry of design and quality appearance of the Bulletin 709 line are assets to any installation and are especially valuable to resale manufacturers. Send for bulletin, today!



Size 1
25 Amp.

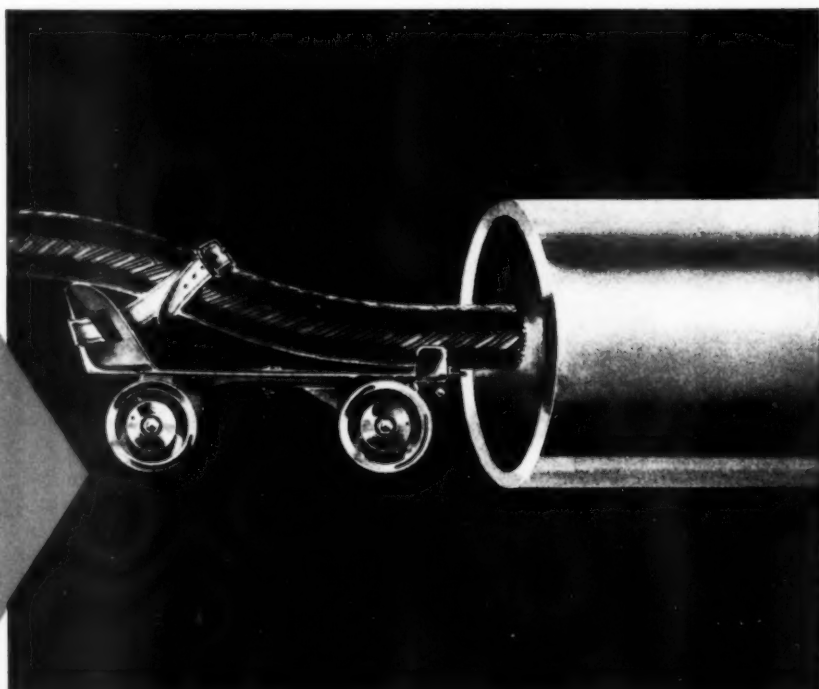
Size 2
50 Amp.

Size 3
100 Amp.

ALLEN-BRADLEY

BULLETIN 709 SOLENOID STARTER

EVER WISH
YOU COULD
DO THIS?



OR THIS?



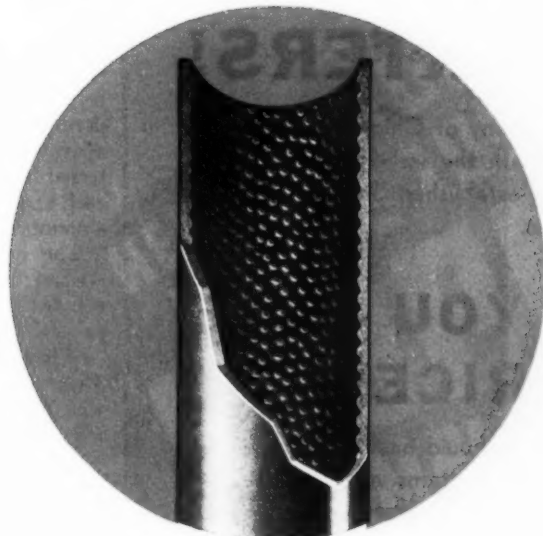
*You don't need to
if you use*

ELECTRUNITE

REG. U. S. PATENT OFFICE

Steeltubes

ELECTRUNITE STEELTUBES



Patent No. 1,962,876

IS THE EASIEST-WIRING CONDUIT EVER DEvised

Many a contractor has sprouted gray hair watching his men trying to coax cable through ordinary conduit. Many a time he has wished that cable came equipped with tiny roller skates or that he could pour oil on troubled raceways.

ELECTRUNITE STEELTUBES with the new inside finish has banished these thoughts forever. The inside surface is covered with tiny rounded projections that act like ball bearings and speed the cable on its way. It's the easiest-wiring electrical metallic tubing on the market. And yet, it still retains all the qualities of the original Steeltubes that startled the electrical industry a few years ago—adequate electrical and mechan-

ELECTRICALLY



• WELDED •

ical protection, light in weight, easy to handle, easy to cut, easy to bend, and fast to assemble because it requires no threading. And despite any stories that you may have heard—ELECTRUNITE STEELTUBES, with all necessary couplings and box connectors, costs less to buy than ordinary threaded conduit.

Try ELECTRUNIT STEELTUBES. Put the new inside finish to a test. If you don't like it, you don't have to keep on buying it—but we know you will like it and will keep right on specifying it just as other contractors are doing. It's a natural. Write us for the name of the nearest supply house carrying it in stock.

Electrical Division

STEEL AND TUBES, INC.

WORLD'S LARGEST PRODUCER OF ELECTRICALLY WELDED TUBING

CLEVELAND • • • OHIO

SUBSIDIARY OF REPUBLIC STEEL CORPORATION



Standard inside finish in 1/2", 3/4" and 1" sizes

CLOCK SYSTEM HEADQUARTERS!

The Stromberg Electric Company of Chicago handles the SALE and SERVICING of both the well-known Telechron Clock Systems and the long-established Stromberg Clock and Time Recording Systems.

BE SURE YOU HAVE OUR PRICES!

Every electrical contractor should have our quotations where clocks or time systems are required. The Stromberg Electric Company offers a complete line of time equipment, which is being used extensively in schools, post offices and buildings of all kinds.

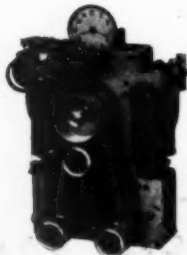
Telechron Clocks

Telechron Clocks and Bell Program Systems are driven by self-starting synchronous motors, and operate direct from alternating current light socket. More than 3,000,000 Telechron Clocks of all types are now in use.



STROMBERG TIME SYSTEMS

Stromberg Clocks, Time Recorders, Time Stamps and Bell Program Systems are furnished either for Master Clock Control or equipped with Telechron Motors.



STROMBERG ELECTRIC COMPANY
219 W. Erie Street, CHICAGO, ILLINOIS

Sales and Service Offices in Principal Cities

ments to different phases the load in the neutral would not exceed that in the live leg which, of course, has its fuse protection.

In the installation cited by our correspondent the contractor, by the use of a No. 14 feed, has not given his customer the advantage of being able to use the full capacity of 15 amperes on both of the circuits in each apartment. As the feed must be protected by 15 amp. fuses the load for each apartment must not exceed that amount.

The use of 3-wire feeds as described above is not to be recommended due to the likelihood of improper connections.

Where the service is 3-wire d.c. or 3-wire single or 2-phase a.c. the 3-wire feed could be safely used. With a 2-wire service no 3-wire feeds or circuits should be used. With the 3-phase 4-wire service where the meters are single phase it is best not to use anything but 2-wire feeds and, of course, with single phase (2-wire) meters, no 3-wire circuits are to be employed.



REINSPECTION PROGRAM RENEWED: A resumption of city-wide reinspection work got under way in Minneapolis, Minn., on October 26 under the supervision of Oscar M. Frykman, chief electrical inspector. This work is done as an F.E.R.A. employment measure similar in scope to the work carried on for four weeks in March. At that time a peak crew of forty-three persons were engaged in this work, which covered thirty-two city blocks in the business zone, and resulted in 591 surveys being made. Three hundred ninety-three premises were found to have sub-standard wiring of greater or lesser gravity. Individual card records were made of these latter cases which have since been partially corrected. It is now proposed to make a recheck of these records and to enlarge the scope of reinspection operations under the recent resumption of activities.



JEFFERSON Super-Lag Fuses Eliminate Needless Motor Shutdowns

Your customers must pay men whether they are busy or "stopped". Unnecessary blowing of fuses on motor circuits causes delays that mean lost production. . . . You can increase your fuse sales by explaining how Jefferson Super-Lag Fuses prevent losses.

Jefferson Super-Lag Renewable Fuses provide reliable, accurate protection—riding over harmless, momentary surges—operating positively on extended, dangerous overloads. There is no better protection for electrical equipment and property—and against payroll loss for STOPPED TIME. There is no better way to increase your fuse sales than pushing Jefferson Super-Lag Renewable Fuses.

Made in all capacities — knife-blade and ferrule types.

Fuse Chart—FREE

A handy guide to selection of proper size fuses at a glance, for the adequate protection of motors. Ask for Fuse Chart No. 19

JEFFERSON ELECTRIC COMPANY
Bellwood (Suburb of Chicago) Illinois



The secret of Jefferson Super-Lag performance lies in the lag plate which is a part of the Super-Lag link. This plate retards the normal fuse action, provides a time interval or lag. This time-lag prevents the fuse from blowing on harmless temporary overloads—saves needless shutdowns and link replacements.

JEFFERSON

Super-Lag

RENEWABLE FUSES

CODE AUTHORITY NEWS

Material for this Department is furnished by The Electrical Contractors' Code Authority headquarters staff.

L. E. Mayer, Chairman,
569 W. Van Buren St.,
Chicago, Ill.

E. N. Peak, Vice-Chairman,
Marshalltown, Iowa

A. J. Hixon
Boston, Mass.

D. B. Clayton,
Birmingham, Ala.

L. W. Davis, Executive Officer,
420 Lexington Ave.,
New York, N. Y.

J. G. Livingston,
New York, N. Y.

W. W. Ingalls,
Miami, Fla.

Lloyd Flatland,
San Francisco, Cal.

W. A. Ritt,
Minneapolis, Minn.

R. W. Hodge,
Kansas City, Mo.

R. L. Jacobs,
Houston, Texas

The Code of Fair Competition for the Electrical Contracting Industry is sponsored by the National Electrical Contractors Association

HOW TO SECURE COMPLIANCE

To the Members of the Code Authority, Regional Chairmen, District Chairmen, and Local Administrative Committees:

Your chairman is desirous of calling your attention to the many complaints that are being received regarding non-compliance of members of our industry and we find upon investigation that many complaints are not completed in a way that can be presented to the N.R.A. Compliance Board for a decision. We must remember when we present complaints to the compliance directors or to the administrators in Washington that in accordance with the Federal Government requirements, they must be complete cases in every instance, developing information as to the cause of violation and the many routine requirements that will make a complete case when presented for final decision.

It has been proven to me by the N.R.A. and the compliance directors in every instance that they are desirous of giving us all the service they possibly can in the ultimate decision of complaints and adjustments, so that the only thing we have to do is to get our work so developed that there can be no misunderstanding in regard to the complaint, the reasons for its origin, and the decisions by the administrative bodies prior to its presentation to the N.R.A.

Therefore we urge you in the future to present cases complete in every particular, not necessarily as lawyers, but as business men.

Moreover, let us not be hasty in our decisions to determine that the Code cannot be operative, or that we cannot get just compliance, because we are positive that if our work is carried out to the fullest extent we are going to get the compliance that we request. The most recent publicity presented in the newspapers indicates the desire of the Administration to reinforce its legal department and local compliance directors' administrative forces to get better enforcement and compliance from the industry.

The recent election indicates the desire of the majority of the people of this country to sustain the Administration and work for the New Deal. With the reinforced assurance this gives to the President and his Cabinet together with his Administrative bodies, we should feel assured that we are going to get the effect that we desire in the administration of our Code—compliance respect, and better conditions.

L. E. MAYER, chairman
Electrical Contractors Code
Authority.

Code Violation Figures

Up to October 15 the 340 local administrative committees throughout the country had received 1,847 complaints of Code violations. Of these 24 were rejected without investigation, as unjustified by the facts; 1,280 were adjusted; 205 were investigated with no violations found; 73 were referred to local and state compliance boards; and 265 were still on hand. Thus 1,509 or 81 per cent of the 1,847 complaints were handled by local administrative committees without the necessity of referring them to compliance boards.

Provisions most frequently violated were those pertaining to the filing of bids, being caused by contractors trying to cut their bid after they learn that lower bids than their own have been made.

New Basis for L. A. C. Funds

The Code Authority has applied to the National Industrial Recovery Board for an amendment to the basis of contribution by members of the industry for expenses of local code administration. The present basis of contribution to local administrative committees is one-tenth of one per cent assessed against contracts registered of \$250 and over. The proposed amendment would increase this basis to one-fourth of one per cent of all contracts without limitation as to their size. The time limit for submitting criticisms, objections and suggestions concerning the proposal expires on December 3.

Safety and Health Standards Approved

Standard Safety and Health Provisions submitted by the Code Authority as required under Section 11, Article II, Chapter VI, of the Code have been given final approval by the NRA. These minimum standards were prepared through cooperation of the Department of Labor and the Labor Advisory Board of NRA. The sub-headings of the standards include scaffolds, access to overhead work, machine guarding, machines and hand tools, overhead protection, work on live circuits, climbing tools and safety belts, marking of circuits, manholes and other confined spaces, inspection and testing of safety equipment, instruction of employees, arti-



Make your wiring systems explosion proof, in those hazardous locations, by using this standard full weight rigid steel conduit.

**THE YOUNGSTOWN SHEET
AND TUBE COMPANY**
General Offices-YOUNGSTOWN, OHIO

YOUNGSTOWN
BUCKEYE
CONDUIT

Put Sales Push behind

ARROW
SCREWLESS HEATER PLUGS

REMOVE YOUR ELECTRIC APPLIANCE CORD SET TROUBLE

HELD TOGETHER BY SPRING CLIPS

NO SCREWS TO LOSE OR LOOSEN

Silver foil background

blue and red lettering

Catalog No. 83
Contains
5 No. 7762 Switch
Plugs
5 No. 7760
Switchless Plugs

Catalog No. 84
Contains
10 No. 7760 Switch-
less Plugs
Std. Pkg. 10 Carton 1

THE ARROW-HART & HEGEMAN ELECTRIC CO. HARTFORD, CONN.

HEATER PLUG COUNTER DISPLAY

On your counter or in your window this display will bring prominently to the attention of your customers **THE Screwless Heater Plug** which has eliminated cord set trouble and annoyance. Faced with brilliant silvered foil, lettered in red and blue, the display takes the product out of boxes and puts it where it meets the demand for a plug that holds together. . . The Screwless Plugs are priced at levels your customers can afford, and allow an attractive profit to you. Your Jobber will be glad to quote you.

ARROW ELECTRIC DIVISION
THE ARROW-HART & HEGEMAN ELECTRIC CO. HARTFORD, CONN.

ficial lighting, housekeeping, sanitation, reporting of unsafe conditions, medical aid, physical examination and report of industries.

The standards specify that all workers should be given a physical examination previous to employment and at intervals of not exceeding a year during employment. If exposed to substances hazardous to health the worker shall be given physical examination at such intervals as to insure that precautions can be taken to safeguard his health.

Bid Depository Directory Available

The compilation of a directory of the 330 Bid Depositories which were approved up to October 22 has been completed. Copies of this directory will be distributed to all electrical contractors, all bid depositories, local and regional administrative committees, and copies will be filed with all NRA and other governmental departments, and with State and local Compliance Directors.

NRA Rules Fixture Assembly and Installation Different

Col. George S. Brady, deputy administrator, N. R. A., has handed down the following opinion refusing the request of the artistic lighting equipment manufacturing industry for a stay from the operations of the Electrical Contracting Code by distinguishing between assembly and installation:

I understand that the point at issue between the two industries is the assembly at the place of installation, of large chandeliers and similar fixtures which, because of their size, cannot be delivered in a completely assembled condition.

Chandeliers and fixtures of a size, which require that they be delivered in a partly assembled condition, are individually designed and made to order, and it is presumed that the manufacturer is obligated to furnish a completely fabricated and assembled article. Assembly or re-assembly at the point of installation may require a specialized knowledge and skill, which is only possessed by the manufacturer.

I believe that this assembly or re-assembly on the floor prior to actual installation is a part of manufacturing, and that it should be performed under the code for the artistic lighting equipment manufacturing industry, and that the Code for the Electrical Contracting Division of the Construction Industry applies when actual installation is undertaken, either by the fixture manufacturer or by an electrical contractor. Consequently a stay is unnecessary.

THE WIREMOLD ZONE

THERE IS A WIREMOLD ZONE OF USEFULNESS AND PROFIT IN EVERY FIELD OF WIRING PRACTICE!

NUMBER 3 OF A SERIES ON WIRING OPPORTUNITIES

BASEBOARDS!

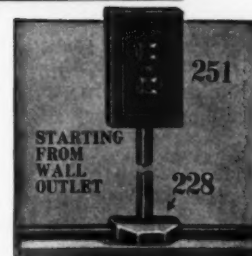


An example of how Wiremold smoothes all obstacles in this field!

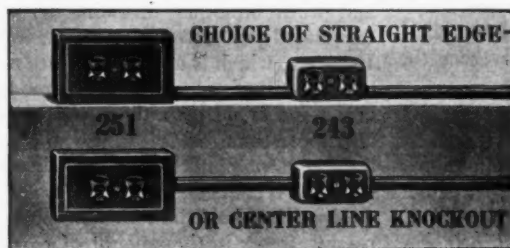
THE great beauty of the Wiremold system is that it gives the contractor A CHANCE TO USE HIS OWN GOOD JUDGMENT to the best advantage. He can utilize his skill and experience to the utmost.

Here, for instance, is an illustration of Wiremold versatility applied to baseboards. No contractor can ever tell what he will be up against on a baseboard job—but all wise contractors know that Wiremold will help solve the problem whatever it is.

And the same is true in every field of wiring practice.



No matter what your particular problem may be Wiremold will solve it nicely!



See how snugly Midget can be made to fit on top of baseboard or on the side of it. Just one instance of Wiremold versatility.

THE WIREMOLD COMPANY, Hartford, Conn.



CONTRACTING news

INFORMATION OF INTEREST TO ELECTRICAL CONTRACTORS
CONSISTING OF ITEMS OF NEWS, SHORT ARTICLES, PRACTICAL
IDEAS, ETC., OUR READERS ARE INVITED TO CONTRIBUTE TO
THIS DEPARTMENT

CLEVELAND LEAGUE SILVER ANNIVERSARY

The Electrical League of Cleveland, the oldest electrical league in the country, will celebrate its silver anniversary at a dinner in the Hotel Cleveland on December 8. The speaker of the evening will be Charles Francis Coe.

DETROIT AREA AGREEMENT SIGNED

The NRA regional collective bargaining agreement for Detroit and its metropolitan district was signed by President Roosevelt October 30 and prescribes these wages:

Foremen—Not less than 12½ per cent more than wages for skilled electricians.

Skilled electricians—Not less than \$1.25 per hour for work during regular hours.

Apprentices—Not less than 40 cents per hour the first year, 45 cents the second year, 75 cents the third year and 90 cents the fourth year.

Except on operating maintenance and repair work and construction maintenance work overtime shall be paid twice the regular rate. In the excepted classifications overtime for the first three hours after the first eight regular hours is one and a half times the regular rate. Beyond 11 hours the overtime rate is twice the regular rate.

The agreement establishes the 40-hour week with no work in excess of eight hours in any 24-hour period or five days in any seven. Regular hours extend from 8 a. m. to 4:30 p. m. Monday to Friday inclusive. Operating maintenance and repair work, and construction maintenance work are permitted at any time.

The agreement affects between 1,500 and 2,000 employees and 458 industry members. Business volume for the district decreased from \$12,035,000 in 1929 to \$3,787,000 in 1933 and average journeymen's wages from \$1,880 to \$580.

N.E.C.A. SENDS OUT MORE DISCOUNT SHEETS

In line with its program to inform members about discount sheets that conform with its policy for a preferential discount to contractors and dealers in recognition of their part in the chain of distribution, the National Electrical Contractors Association on November 12 sent out to members the discount sheets of a number of electrical manufacturers. Additional sheets will be sent out in the same manner when submitted by the manufacturers.

F. H. A. PROGRESS

The Federal Housing Administration reports continued gains in all directions. Over 70,000 jobs employing almost twice as many men, it states, have been created by the loans alone, which on November 16 numbered 41,275 and totaled \$17,587,850.

Counting the amount of cash work and work on other financing terms stimulated by the Better Housing Program, which is about five times as great as that financed under the modernization credit plan, there are probably more than 700,000 men who owe their present employment directly to the Better Housing Program.

More than half the states are progressing faster in the amount of modernization and repair being done than was originally expected. Six states are proceeding fully twice as fast.

On November 16 there were 3,904 community campaigns either already organized or in the process of organization.

DISCUSS CODE AND INDUSTRY POLICY AT SAN FRANCISCO

A new program of quarterly meetings was initiated at the November 9 meeting in San Francisco of the Electrical Contractors Association of Northern California which took up Code and industry policy matters.

The motor section presented a strong protest against the new motor discounts and a committee was appointed to take more definite action in this connection.

A report was made on the Industry Board of Review newly formed to handle matters of competitive practices between the different branches of the industry.

Many phases of N.R.A. Code operations were reported on including bid depositories, area agreement negotiations, Blue Eagle distributions and compliance.

FAVOR HIGHER LICENSE FEE TO INSPECTION FEES

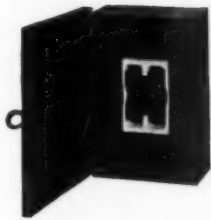
Fourteen of the 15 principal electrical contractors associations in Greater New York have gone on record against the city's proposal to charge an inspection fee for each individual job, graduated upward from a \$1 minimum, and in favor of increasing the renewal of master electrician's license fees from \$10 to \$100 per year.

When Mayor LaGuardia entered office he requested the heads of all city departments to propose means by which each department could be made self-sustaining financially. The Department of Water Supply, Gas and Electricity, as one means of satisfying the Fusion mayor's desire, proposed the inspection fee.

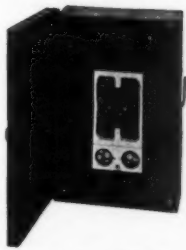
It should be understood that the opposition is not directed against the underwriters' fee system—such fees will continue in force in any case. The opposition is against the institution of a city inspection fee per job.

Leaders of the opposition deny that their campaign for an increased license fee rather than inspection fees would be detrimental to the small contractor. They insist, rather, that their solution of the city's problem

YOU CAN CASH IN ON N. H. A. PROJECTS WITH THESE BULLDOG MAIN SERVICE, RANGE AND LIGHTING CABINETS



Cat. No. 55200
Dead Front Service
or Range Switch
LIST\$7.50



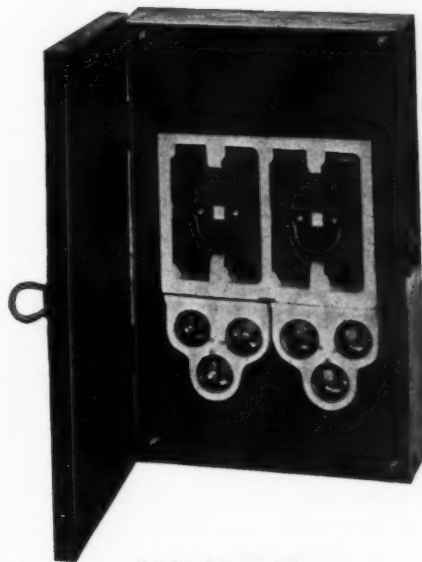
Cat. No. 55202
Dead Front Service
or Range Switch with
2 Plug Fusible Circuits
LIST\$9.50



Cat. No. 55204
Dead Front Service
or Range Switch with
4 Plug Fusible Circuits.
LIST\$11.50

THE NEAT COMPACT CABINETS SAVE SPACE AND THE SOLDERLESS LUGS AND OTHER QUICK-WIRING FEATURES SAVE TIME AND MATERIAL, WHEN INSTALLING.

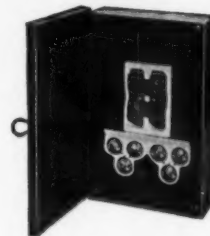
THESE ITEMS ARE APPROVED AS SERVICE SWITCHES, EXTERNALLY OPERABLE AND SEALABLE.



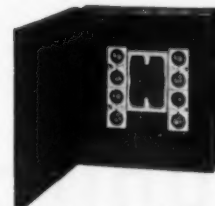
Catalog No. 551206
LIST\$16.00

This provides 2 60-amp., 3-pole solid neutral SAFtoFUSE Switches and 6 30-amp. plug fusible circuits.

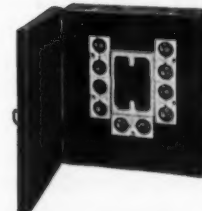
Two of the plug fusible circuits may be used as a direct water heater circuit.



Cat. No. 55206
Dead Front Service or
Range Switch with
6 Plug Fusible Circuits
LIST\$13.50



Cat. No. 55208
Dead Front Service or
Range Switch with
8 Plug Fusible Circuits
LIST\$17.50



Cat. No. 55210
Dead Front Service or
Range Switch with
10 Plug Fusible Circuits
LIST\$21.00

Safety Switches—Fusenters
SUPERBA Lighting Panels & Cabinets
SAFtoFUSE Feeder Panels & Cabinets

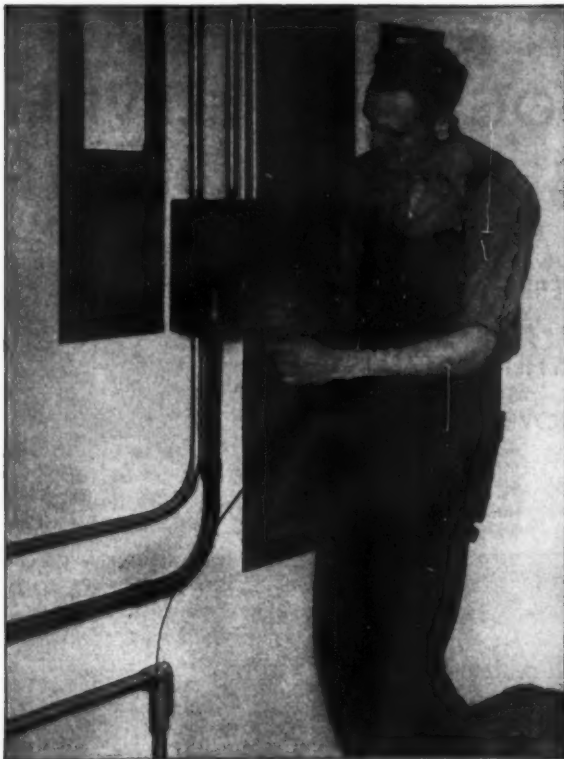


BUStribution SYSTEMS—SAFtoSWITCHBOARDS
Kbl-DUCT—Trol-e-DUCT—Bus-DUCT
Circuit Breaker Type Panels & Cabinets



BULLDOG ELECTRIC PRODUCTS CO.

DETROIT MICH. U.S.A.



uniform conduit MEANS PERFECT JOBS

Every length of Fretz-Moon Conduit is absolutely uniform—correct in size; with a perfect weld that will not open under severe bending; a total absence of hard or "burnt" spots in the metal; clean inside and out; unparalleled ease of cutting, bending and threading; threads that are clean, accurate, sharp and free-running; enameled and galvanized surfaces that will not chip, crack or flake under bending strain, and that resist wear; a uniform raceway with full diameters at bends; absolute freedom from burrs or rough edges; installation speed second to no other rigid conduit.

Because it is made of highest quality materials by the exclusive, scientifically-controlled "continuous process," Fretz-Moon Conduit offers the maximum in uniformity in these ten features. And because of its high uniformity, every job on which it is used is a perfect one that pays profits to all concerned.

You'll be interested in the full story of this uniform rigid conduit. Write for it.

STEEL AND TUBES, INC., CLEVELAND, OHIO

FRETZ-MOON
RIGID CONDUIT

EXCLUSIVE SALES AGENTS

would benefit the small contractor. They point out that the number of master electricians' licenses issued by the city, at this writing, is 4627. Of these they say about 1500 are electrical contractors of the kind who devote their whole time to such business.

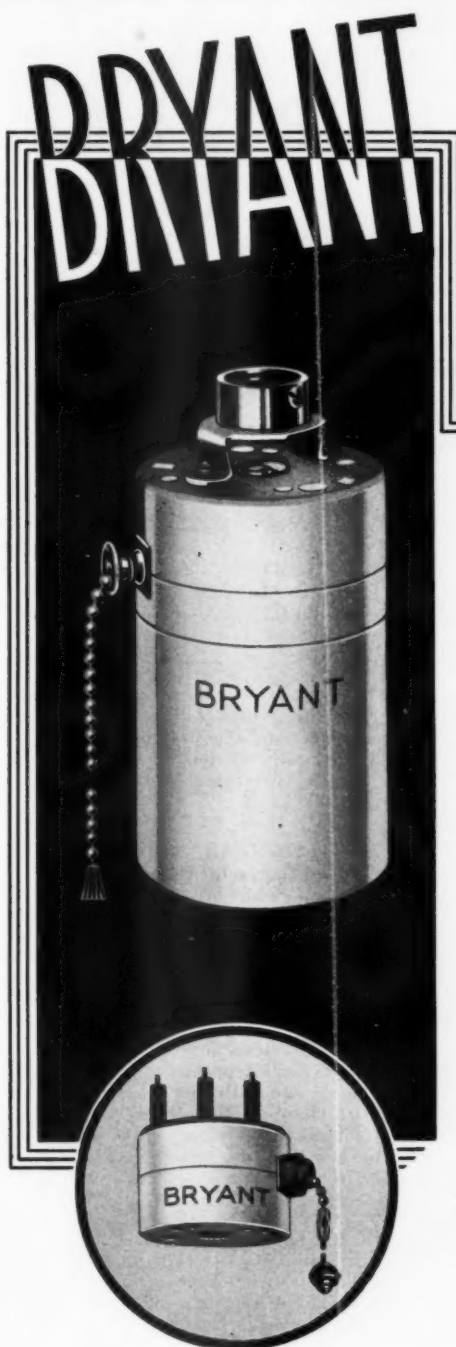
Among the 4627 holders of master electricians' licenses it is estimated that about 20 per cent only might fail to renew their licenses if the fee was raised from \$10 to \$100. Most of these 20 per cent are men who do electrical work as a sideline to their regular work, in competition against the legitimate contractor. It is also estimated that about 1000 electrical contractors in Greater New York do between 80 and 90 per cent of the business.

YOUNGSTOWN F.H.A. CAMPAIGN FEATURES SPECIAL INDUCEMENTS

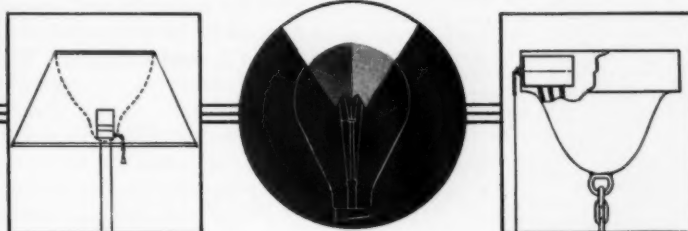
A united industry effort for capitalizing the wiring market in the F.H.A. campaign takes in the Youngstown Electrical League, Electrical Contractors Association, local utility and the electrical workers. A 60-day special price schedule is offered as an inducement to the public which will apply to all orders secured up to January 15, 1935. This is claimed to represent a reduction of from 20 to 35 per cent below the prevailing market, due to lowered labor costs for the modernization jobs which are actually recorded by con-



A TRUCE: Government inspectors and representatives of A. S. Schulman Company, Chicago contractor installing the feeder system to supply energy to the electric dredges at Fort Peck, Montana, declare truce long enough to have picture taken. Left to right, C. W. Winkle and H. M. Schulman, with the three inspectors, O. S. Clark, C. H. Plumlee and M. A. Pithand.



Leads with
 a new **MOGUL PORCELAIN PULL SOCKET**
 and a new **PORCELAIN CANOPY SWITCH**
for THREE-LIGHT LAMPS



The introduction of 3-light lamps brought about a need for sockets and switches. Bryant promptly offered a comprehensive line. The effort to meet new conditions never ceases. Now Bryant leads the way with a new Mogul porcelain pull socket and a new porcelain canopy switch; both of sufficiently high capacity for 3-light lamps.

MOGUL PORCELAIN PULL SOCKETS

1500 WATTS, 250 VOLTS

Operating 1, 2, 1 and 2, off

CATALOG NUMBER	DESCRIPTION	LIST PRICE PER 100
4565	Pull Body Only	\$150.00
4573	3/8-inch Brush Brass Cap	10.52
4583	3/8-inch Brass Yoke	5.26

Body Diameter, 2 3/16 Inches

Body Length, 3 7/8 Inches

Body Mounting Screw Centers, 1 7/16 Inches

PORCELAIN CANOPY SWITCH

10 AMPERES, 125 VOLTS; 5 AMPERES, 250 VOLTS

Operating 1, 2, 1 and 2, off

With 6-inch Leads No. 16 C.F. Wire

Diameter, 2 3/16 Inches

Height, 1 7/16 Inches

Mounting Stem, 13/32 Inches Long

Catalog Number, 4590

List Price Per 100, \$90.00

FOR FURTHER INFORMATION WRITE TO
 THE NEAREST BRYANT OFFICE



BRYANT *Superior Wiring Devices*
 Manufactured by THE BRYANT ELECTRIC CO., Bridgeport, Conn.

MANUFACTURERS OF "SUPERIOR WIRING DEVICES" SINCE 1888 . . . MANUFACTURERS OF HEMCO PRODUCTS

NEW YORK 100 East 42nd Street . . . CHICAGO 844 West Adams Street . . . SAN FRANCISCO 149 New Montgomery Street

GREENLEE TOOLS *Are Profitable Investments*

WHEN you invest in Greenlee Benders and Knockout Tools, you are helping yourself to meet competition and to make a profit on each job. In fact many cases can be cited where these tools have more than paid for themselves on the very first job. And they are liked by the mechanics, too, which is much in their favor.



Hydraulic Conduit Benders

Greenlee Hydraulic Benders are profitable investments, because they bend conduit quicker and easier than by other methods. In addition they make smooth, even bends, eliminating many fittings and making it easy to pull in wire and cable. They are easy to take to the job, too, because they are portable.



Knockout Tools

Greenlee Knockout Punches and Cutters make it easy to enlarge holes in switch boxes, cabinets, etc. They form clean-cut holes quickly and accurately, without any reaming or filing. And they are easy to operate in close quarters, too.

Other Tools

Hydraulic Pipe Pushers

Joist Borers

Electrician Bits

Bit Extensions

Let Us Send Complete Information

Greenlee
TOOL CO. GREENLEE
ROCKFORD, ILLINOIS, U.S.A.

GREENLEE TOOL CO.
ROCKFORD, ILLINOIS

Please send complete information on the following:

- ☐ Conduit Benders
☐ Knockout Tools

Name
Street
City
State
My Jobber is.....

12-34

tractors during the campaign, and also a voluntary scaling down by contractors of their prevailing overhead charges. A series of newspaper advertisements are being run under the auspices of the league, which lists the names of eleven local contractor participants and underwriters of the campaign.

E. J. Beile, league secretary, has arranged for a display of obsolete wiring materials and methods to be placed in the show windows of prominent downtown stores. The displays will include (1) evolution from antique fixture canopy link fuse cut-outs up to present day no-fuse centers, (2) early types of rotary and snap switches to most recent types of tumbler and compact devices, (3) tarnished plates alongside of modern color blending plates, and (4) various horrible wiring examples alongside modern materials.

JOHN WILHELM

John Wilhelm, who was in the electrical contracting business since 1909, died suddenly at his home, in Brooklyn, N. Y., on October 29 at the age of 48.

Mr. Wilhelm was a fine example



John Wilhelm

of the association-minded type of contractor. He was a member of the National Electrical Contractors Association, the Independent Electrical Contractors Association of New York, the Electrical Association of New York, Electrical Appliance Dealers Association of Brooklyn, Electrical Club of Brooklyn, Electrical Associates Club and Bay Ridge Dependable Merchants Association. In all of his associations he could be counted upon to take an active interest.

A ROLL O' TAPE

ELECTRICAL FLASHES
GATHERED AMONG THE
BIG WIRE AND PIPE MEN
BY
ELECTRICAL CONTRACTING'S
FIELD EDITORS

FIFTY-SEVEN cities and one state (North Carolina) have adopted laws controlling the sale of electrical material and appliances.

TORONTO, the birthplace of Red Seal Wiring, expects to revise its Red Seal Specifications the first of the year requiring more outlets in various rooms. Adequacy is moving forward.


A. J. DUNBAR, well-known electrical contractor in St. Louis, has just been honored by being appointed a member of the new Electrical Examiners' Board of that city. Mr. Dunbar has been in the business 30 years and has been especially successful in theatrical work.

POWER factor correction and off-peak load control problems interest A. F. Preeter of the Preeter Electric Co., Toledo, Ohio. His industrial work shows sufficient increase to justify the interest he has taken in such specialized problems.

IN wiring post-office jobs through several states, J. R. Hanzlik of the Universal Electric Construction Co., Minneapolis, Minn., traveled over 50,000 miles in twelve months.

ONE of Wisconsin's largest electrical jobs, an insurance building addition in Milwaukee, contains a three-compartment metal underfloor raceway system. Uihlein-Ortmann Electrical Company, local contractors, claim to have installed five carloads of metal duct in this job.

THREE-PHASE, 4-wire branch lighting circuits were employed in the Navy Hangars at Pensacola, Fla., to obtain a perfect load balance throughout the wiring system. Lighting units were cir-



A NEW FINGER in the DYKE

Since the earliest days of generated electricity there has been a constant search for the ideal dielectric. Many have been the attempts further to plug the leaks in electrical transmission with improved insulation.

It remained for the United States Rubber Company to make a startling advance in dielectrics with its newest development—LAYTEX.

It came about through an unceasing search into the technology of liquid latex—the virgin rubber before being coagulated or worked.

Triple-creamed latex applied to electric wire in a continuous process of building up the insulation by repeated dips—offers the electrical industry a product of startling possibilities—

Laytex

It has electrical and physical characteristics never before achieved. It sets new standards in dielectric strength—inductive capacity—uniformity—centering—tensile strength—elongation—weight.

We invite electrical manufacturers and engineers to ask for fuller technical information. While all the avenues of LAYTEX'S ultimate usefulness have not been fully explored, sufficient progress has been made to warrant the serious attention of the electrical industry.

Truly, here is a "new finger in the dyke."

United States Rubber Company

1790 BROADWAY

US

NEW YORK CITY

cuit for triple outlet simultaneous switching, using a 3-pole motor type tumbler switch, specially fitted with flush plates. The switch interrupted "A," "B" and "C" phase outlet conductors, which were coded black, red and green respectively, the neutral being white. This code was carried out as well within all fixtures by S. C. Sachs, Inc., of St. Louis who had the contract.

A BIG Code task—suggested Code changes numbering 163 revisions were submitted during the year to the 31 members of the executive council of the I.A.E.I. for consideration. According to their News-Bulletin, 148 suggestions received the approval of the council during the course of 25 meetings, after 51 items were suitably amended.

A WORTHWHILE sideline which was taken on several years ago by the Colonial Electric Company of Cleveland, Ohio, involves the reading and calibration of tenant sub-meters for several large office and loft buildings. It takes one day each month for the preparation of bills in the contractor's office.

IMPROPER use of artificial light caused an occupational accident every 46 seconds and a fatal accident every hour in America last year according to D. W. Atwater, of the Westinghouse Lamp Company, and general secretary of the Illuminating Engineering Society.

TOLEDO'S commissioner of buildings, Arnold DeFrance, is a past president of the Toledo Electrical Contractors' Association, therefore the electrical inspection department of that city is given every help that city funds will permit.

A. H. BORCHERDING, residential and remodeling specialist in St. Louis, can testify that the recollection of quality work is often remembered long after the contractor's name is forgotten. Recently a man for whom he did a job several years ago hunted him up with another one, stating that he had to go to his files and dig up the original contract to make sure who did the work.

A NEATLY framed honorary life membership in the Minnesota Electrical Association is prominently located in the private office of Frank T. Langford of the Langford Electric Company, Minneapolis, Minn. This testimonial was presented Mr. Langford in recognition of his work in organizing the local electrical industry.

THE "Radio City" of the West will open soon in Denver, Colo. N.B.C. will have its Rocky Mountain studios and offices in this building. The electrical work was divided into three contracts. One, for the light and power wiring, was

handled by the Denver Electric Company. The Queen City Electric Company has the second, that for the conduit for the radio and control wiring. Contract for the r. & c. wiring was still to be let at the time of going to press.

SELLING new prospects with photographs of work previously done gets results for R. R. Knoerr of Knoerr-Fischer, Inc., Milwaukee, Wis. A sales manual is kept up-to-date with large commercial photographs of outstanding lighting and power jobs done by this firm during its 29 years in business.

IT'S funny how jobs run. Right now W. A. J. Guscott of Denver seems to be in the food and drink business. Just as he finished wiring a large plant extension for the Tivoli Brewing Company, Denver, Colo., he started the installation at the Colfax Drive-In Market which he is now finishing up.

BBETTER Light—Better Sight is being featured in a 20-week, two and a half hour per evening course termed "Practical Illuminating Engineering" which is available at very low cost in the William Hood Dunwoody Institute, a non-profit Minneapolis trade school. Fourteen other electrical courses are also listed in an announcement which was recently sent to electrical men in that city.

MAKING a \$7,000 job out of an \$1800 residence wiring contract is a noteworthy feat at any time. But Joe Overmeyer of the Overmeyer Electric Co., Toledo, Ohio, takes special pride in having done this selling job for a Toledoan who now has charge of F.H.A. national publicity.

"A JOB comes up in a town fifty or seventy-five miles away. You have some connections there who seem to like your work, and they want you to bid on it or even take it on a time and material basis. The proposition looks good, but it has been my experience that it almost never pays. I am speaking now of the small town local contractor," said A. D. Miller, of the M. & D. Electric Co., Centralia, Wash. "If you go yourself, send a superintendent or even employ local labor wholly, there is expense attached that the contractor in that city would not have. That means that if price is competitive, you lose by the amount of your extra expense. Even if there is some angle whereby you get the work for a better price than they would have to pay for local talent, how do you know that it is going to be enough? Let some trouble come up that requires extra supervision and more trips and you are up against it. I believe in staying in my local territory and letting the contractors in the other towns do likewise. We will all profit."

PRACTICAL METHODS

SMALL ARMATURE TESTING DEVICE

On account of being unable to test small armatures, such as those in vacuum cleaner motors, between the jaws of a standard "growler" a pair of inexpensive "U" shaped "growler" jaw extension adapters was made up for this purpose by Gale C. Wagner, motor specialist of Olympia, Wash. Laminations of "U"-shaped stove pipe iron were riveted together to 1 in. thickness. The butts of this assembly were then about 1 in. square. These "U"'s slipped over the "growler" jaws thus reducing their inside clearance so as to provide contact for the smaller armatures. This handy tester brought small armature repair orders to Wagner from other local repair shops in addition to his own business.

STORE FRONT BARRICADE WARNING LIGHT

A simple warning light placed in the corners of a boarded-in store front prevents pedestrians from bumping into these temporary sidewalk projections. Bertke Electric Co., Cincinnati,



A PAYING ODD MOTOR DISPLAY: Over 50 fractional horsepower motors in a wide selection of types, speeds and current design are kept neatly displayed in the front part of the Trester Service Electric Company's salesroom in Milwaukee, Wis. It has been found that small motor purchasers come in person to see the equipment desired. Therefore these are kept separate from the large equipment display space, and so receive the same cleaning and dusting as other items displayed in the front office. This complete stock is considered good advertising, as it has led to other larger sales due to being able to supply the need for "freak" motors to perform special functions.



"FOR YOUR PART—

Thousands of entrance services are now being changed to care for the added load of the new equipment and remodeling part of the Better Housing Program.

For this worth while program, tie in with the Trumbull complete line of Entrance, Meter Service, Range Switches, Load Centers and Panelboards.

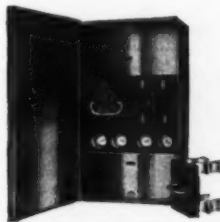
In addition to our regular externally operated switches a new line of less expensive "pull type" switches are described below.



Cat. No. 2903-2

DEAD FRONT ENTRANCE SWITCH WITH BRANCH LIGHTING CIRCUITS

- For 60 Amp. 3 Wire, grounded neutral service. In addition to the 30 Amp. branch lighting cutouts 60 Amp. range terminals are also provided.
- Dead Front Switch has both "ON" and "OFF" position and is indicating.
- A complete line of these Dead Front Switches with or without branch circuits are available. Refer to Catalog 16, page 87-A, and Catalog 16-A, page 22-A.



Cat. No. 2924

DEAD FRONT ENTRANCE AND RANGE COMBINATION

- Provides two separate 60 Amp. Dead Front Switches for Main and Range circuits—also four 30 Amp. plug fuse branch circuits.
- For 3 Wire service with solid neutral grounded to box. Approved as service equipment.
- Main and range terminals are equipped with solderless connectors.

—REMEMBER THE "CIRCLE T" LINE"



THE TRUMBULL ELECTRIC MFG. CO.

A GENERAL ELECTRIC ORGANIZATION

PLAINVILLE, CONN.



Ohio, provided standard sign receptacle outlets with 20-watt red lamps at each end of a barricade in front of a large chain store. A 7-in. wide 12 in. high arched opening was cut into the wood boxing, 5 ft. above the sidewalk, and covered with heavy wire mesh, behind which the warning lamp is located, free of accidental injury, lamp theft and the pranks of street urchins.

TABLE FOR COMPUTING AREAS OF WIRE AND CONDUITS

The computation of total areas of combinations of conductors and the selection of adequate raceway areas to accommodate them is made a simple problem of addition in the accompanying table. This data is taken from the book of uniform additional rulings of the Detroit, Mich., Bureau of Electrical Inspection.

Wire Size	Circular Mil Area of Conductors				Inside Circular Mil Area of Conduit or E. M. T.			
	1	2	3	4	Use Column "B" for runs greater than 50 feet. Use Column "C" for runs of less than 50 feet. For Bare Conductor, use same area as rubber-covered.			
No. 14	51,980	103,960	155,940	207,920	Conduit Trade Size	A Total Area	B 40%	C 45%
No. 12	68,080	136,160	204,240	272,320	3/8"	243,040	97,220	108,370
No. 10	87,600	175,200	262,800	350,400	1/2"	386,800	154,720	193,400
No. 8	103,800	207,600	311,400	415,200	5/8"	678,500	271,400	305,325
No. 6	168,000	336,000	504,000	672,000	3/4"	1,099,000	439,600	494,550
No. 4	236,300	472,600	708,900	945,200	1"	1,903,000	761,200	856,350
No. 3	265,200	530,400	795,600	1,060,800	1 1/4"	2,590,000	1,036,000	1,165,500
No. 2	346,000	692,000	1,038,000	1,384,000	1 1/2"	4,275,000	1,710,000	1,923,750
No. 1	429,000	858,000	1,287,000	1,716,000	2"	6,100,000	2,440,000	2,745,000
No. 0	485,500	971,000	1,456,500	1,942,000	2 1/2"	9,410,000	3,764,000	4,234,500
No. 2/0	552,000	1,104,000	1,656,000	2,208,000	3"	12,600,000	4,940,000	5,670,000
No. 3/0	629,000	1,258,000	1,887,000	2,516,000	3 1/2"	16,208,000	6,483,200	7,293,600
No. 4/0	725,000	1,450,000	2,175,000	2,900,000	4"	25,472,000	10,188,800	11,462,400
250,000	863,000	1,726,000	2,589,000	3,452,000	6"	36,784,000	14,643,600	16,552,800
300,000	972,500	1,945,000	2,917,500	3,890,000	Square Duct Raceway			
400,000	1,072,000	2,144,000	3,216,000	4,288,000	Size	Circ. Mil Area of Duct	20% Fill	
500,000	1,372,000	2,744,000	4,116,000	5,488,000	2 1/2" x 2 1/2"	4,908,750	981,750	
					4" x 4"	12,566,400	2,513,000	

A REPOSSESSION CLAUSE FOR CUSTOMER WORK ORDERS

A work order system developed by Herman Andrae Electric Co., Milwaukee, Wis., incorporates therein a small print material repossession clause which sets forth the terms and conditions of the work involved and ends in an agreement as follows:

"... all of the materials furnished, including the fixtures, whether they shall be attached permanently to the building or not, shall belong to the seller, and the seller shall have the right to

completion to clear the work order for billing. No postings are made on the back of this form. (3) A pink triplicate form identical to yellow form is kept by shop superintendent until job is reported finished as evidenced by the receipt of signed yellow copy from the job. Office postings of material are not made to white form in detail. Materials are charged out and excess items credited on numbered requisitions. These

218 West Chicago Street Milwaukee, Wis.		Herman Andrae Electrical Co.		No. _____
Ordered by _____	Sold by _____	Do Work at _____	When _____	
Approved by _____	Billed by _____	Send Bills to _____		
This Agreement, made this _____ day of _____, 19____, by and between Herman Andrae Electrical Co., hereinafter called the seller, and _____, hereinafter called the purchaser.		Has All Material Been Returned? _____ If Not, Where Is It? _____		
NAME _____				

take possession of said materials and fixtures at any time it may feel insecure, or at any time hereinafter if payment shall not be made when due as herein-after agreed".

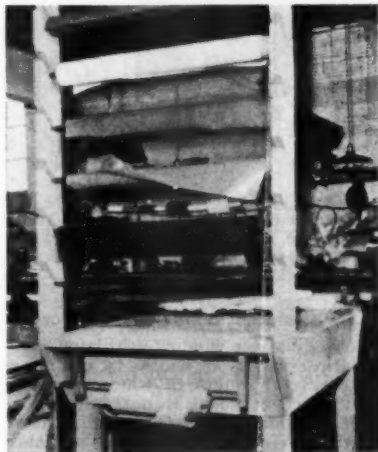
This agreement should be recorded in order to meet certain state legal requirements, however, it is considered to bear considerable weight in collecting for work done, due to the fact that the customer signs a copy of this work order containing this printed agreement when a job is started. This form is used in triplicate, (1) the white form has rulings on back side for the postings of all materials, labor and job expenses. (2) A yellow duplicate form is signed by the customer and comes in upon the job's

requisitions are costed and priced in detail and their totals are posted to back of white work order form. Completed work orders become a permanently bound record.

INSULATING CLOTH TABLE AND RACK

An inexpensive, easily built combined wooden cutting table and storage rack for rolls of oiled linen and other motor insulating cloths cuts down waste, saves time in cutting up desired pieces and keeps the supply in plain view, thus avoiding oversights in ordering replenishment orders. Cutting bench top is made of three 2 in. by 2 in. planks and one 2 in.

by 6 in., all 72 in. long, spiked to two 38 in. long 2 in. by 4 in. horizontal edgewise cross members. Four 4 in. by 4 in. by 33½ in. long legs are nailed to 4 in. face of 2 in. by 4 in. members. Two 1 in. by 12 in. by 72 in. boards are nailed flat against outside faces of each pair of legs as braces. Two 2 in. by 6 in. by 72 in. pieces are nailed vertically 2 in. from



one end of bench for roll rack. These pieces overlap the 1 in. by 12 in. boards for 9 in. below top of bench to provide nailing space and supporting leverage for 2 in. by 6 in. members. A flat 2 in. by 6 in. overlap header joins these members at top, with a similar member nailed edgewise lends additional bracing strength to the vertical assembly. Beginning at top of bench six 1-in. holes on 9-in. centers are bored through flat vertical center line of both 2 in. by 6 in. members, bottom pair of holes being 10 in. above top of cutting bench. Tapered slots are cut out to edge of 2 in. by 6 in. members, slanting upward and widened to an extreme width of 2 in., for ease in inserting cloth roll rods. One-half in. pipe rods, 43 in. long are used in rack with 1 in. by 2 in. wood strip rod keepers nailed over each tier of slot ends on outside face of vertical members.

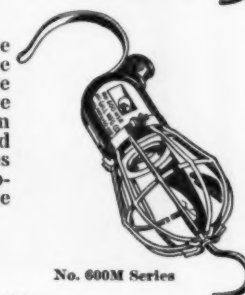
Additional rolls may be stored under table by making suitable rod brackets for end faces of 4 in. by 4 in. legs. A ½ in. fibre sheet, 12 in. wide and 40 in. long is nailed to top of table 14 in. out from roll rack for using straight edge in cutting evenly across the full width of the material. This table was made in the Walker Electric Supply Co's. motor repair shop at Terre Haute, Ind.

Check up on the Features of this New Hook Handle Portable

Here's a guard that is really different. It's real practical—it's new—it has features you can talk about—that will help you get orders. It has greater utility, safety, convenience and time saving value. The new open flat hook and socket housing are big steps ahead in guard construction.



No. 600 Series



No. 600M Series

Tell Your Customers About the Hook Feature

The flat, wide open hook feature makes this new guard at least twice as convenient as any other portable guard ever made. Hook it anywhere—on bench top, over a pipe, between joints, and this hook tends to hold it steady. There are scores of places where this larger flat hook will support the guard, where the old style wire hook would not fit.

New Strain Relief—Another Feature

Stronger and easier to wire, this screw clamp fastener securely grips the cord at the base of the handle, relieving all strain from the socket connections.

Get a supply of our new Hook Handle Portable Guard folders and leave them with your customers.

Twelve different Hook Handle Models to take lamps from 25 to 100 Watts

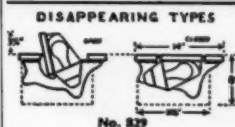


McGILL
MANUFACTURING CO.
Electrical Specialties of Quality
ESTABLISHED 1908
VALPARAISO • INDIANA



Box No. 670

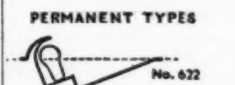
Where to get your FOOTLIGHTS & BORDERLIGHTS



No. 527



No. 530



No. 622



No. 621

We offer the most complete and modern line of theatrical lighting specialties anywhere to be found . . . backed by more than 35 years of practical stage lighting experience, and countless prominent installations. Our Footlights and Borderlights are available in many types for all requirements . . . for schools, lodge rooms, lecture halls, motion picture theatres, and the legitimate stage . . . in both standard and special designs . . . from small portable units to brilliant lighting equipment for the largest theatre; furnished complete, and wired for color control, ready for installation. Best results and satisfaction assured by installing Kliegl Footlights and Borderlights.

CATALOG

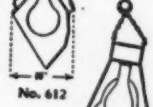
Showing complete line available, your request will bring a copy to you by return mail.



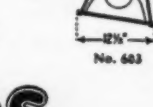
No. 608



No. 602



No. 612



No. 603

KLIEGL BROS

UNIVERSAL ELECTRIC STAGE LIGHTING CO., INC.

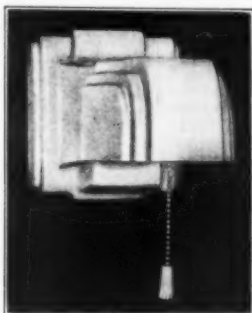
Theatrical · Decorative · Spectacular · Lighting

321 West 50th Street • New York, N. Y.

December New Products

Alabax Light Fixtures

Pass & Seymour, Inc., Syracuse, N. Y., announces AL-2270 fixture (for switch box mounting only) designed for use with either 25 or 40 watt T-10 lamp, sup-



plied complete with tubular, opal glass shade, and AL-2380 (shown above), a modernistic over-the-mirror piece with glass styled to match. Manufacturer states that fixture AL-2380 is designed to provide not only a modernistic atmosphere, but good lighting as well. Unit is supplied with convenience outlet, if desired. Both pieces are available in standard Alabax colors, namely white, black, light green, sea green, ivory or orchid.

Picture and Shelf Light

Wilson Lighting, Inc., Chicago, Ill., announces a picture and shelf light for lighting indoor signs, displays, pictures, shelves and show cases. According to the manufacturer the scientifically de-



signed elliptical reflector gives higher efficiency and projects the light more evenly. This unit takes a standard 60 watt lamp, while most reflectors of this type require a special 25 watt lamp. Complete with universal mounting bracket for fastening to either vertical or horizontal surfaces, wired with cord and plug. Lacquered gold bronze finish. Overall length 19 in.



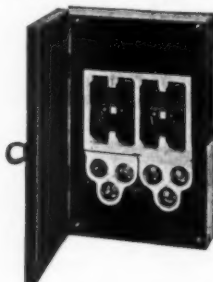
Conduit Outlet Fittings

A line of conduit outlet fittings has been placed on the market by Killark Electric Mfg. Co., St. Louis, Mo. These fittings, which are somewhat smaller than the company's present line, will be named the "EZ" line. The fittings are made of malleable iron and can be used with $\frac{1}{2}$, $\frac{3}{4}$ and 1 in. standard conduit, either threaded or threadless, or with electrical metallic tubing. Units are made in all the popular types and are provided with blank covers, insulators

and Edison base receptacles. Fittings are finished with a burnished cadmium plating which the manufacturer claims protects them against rust, and being made of malleable, they are not easily broken.

Service and Range Panel

A line of combination meter-switch-fuse wiring sequence main service and range panels, with connections for 2, 4, 6, 8 and 10 plug fusible lighting circuits is announced by the Bull Dog Electric Products Co., Detroit, Mich. Main serv-



ice and range feeder circuits are composed of 60 amp. SAFtoFuse cartridge fusible switches. Solderless connectors are supplied as standard equipment. Cabinets have been made unusually compact at a saving in mounting space, while it is claimed that the design will result in a saving in installing time.

Adjustable Stock Guide

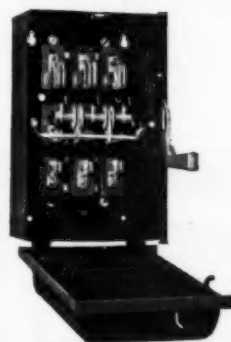
A compact threading of malleable iron, stock employing solid dies and an adjustable, built-in guide for $\frac{1}{4}$ in., $\frac{3}{4}$ in. and 1 in. conduit is announced by Nye Tool & Machine Works, Chicago, Ill. Dies are $2\frac{1}{2}$ in. by $2\frac{1}{2}$ in. square of one piece, designed to produce a stand-



ardized conduit thread and are claimed to cut with minimum effort. Guide is self-contained and adjustable to either of three conduit sizes by loosening a thumb screw and centering the scroll until the guide jaws contact the pipe, after which this setting is fixed by tightening the thumb screw. The old type individual guide bushings are eliminated.

30-Amp. Switch

The Switch & Panel Division, Square D Company, Detroit, Mich., announces a 30-amp. switch for its 80,000 line, with an elevated removable base for simplified wiring, front operating handle and cover which opens down instead of at the side. The blades are visible. The construction of the switch permits a smaller enclosure than for the conventional type of visible blade switch, and the cover design is modernistic with beveled edges. This switch, which is



similar in construction to the Square D 50,000 line, is obtainable in 30 amp., 2 and 3-pole fused and unfused and 3 and 4-wire solid neutral.

Adjustable Window Ventilator

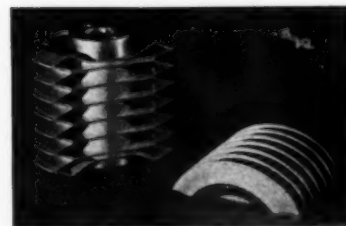
An adjustable window ventilator available in a variety of widths to accommodate several ranges of window sizes is announced by Diehl Manufacturing Co., Elizabethport, N. J. This unit, known as their Wind-O-Vent, can be furnished



with pearl grey finished metal panels or in a deluxe model with plate glass panel and chromium plated supports. Its design permits the raising or lowering of windows and the use of curtains and shades without interference. Fan blades are 10 in. in diameter and are claimed to withdraw 800 c.f. of air per minute with a current consumption of 35 watts. The unit is furnished with a switch, 8 ft. cord and plug and installing screws.

Texrope Sheave

The Texrope Division of the Allis-Chalmers Manufacturing Co., Milwaukee, Wis., announces its Duro-Brace Textsteel sheave, a recent reinforced steel development. The outside walls of this sheave are reinforced by a convex



steel plate which is claimed to strengthen these vulnerable areas so as to practically eliminate distortion or being thrown off true, irrespective of excessive overload strains. Additional strength and rigidity is claimed to have been provided for this product by welding at the rim and web of the sheave, and also by the interior grid-type of construction.

Electrical Contracting, December, 1934

NEWS MANUFACTURERS

A DEPARTMENT FOR THE ANNOUNCEMENT OF ACTIVITIES OF MANUFACTURERS THAT ARE OF INTEREST TO CONTRACTORS, SUCH AS CHANGES IN EXECUTIVE PERSONNEL, BRANCH OFFICES, NEW PRODUCTS, ETC.

CHANGES ANNOUNCED IN BRYANT ORGANIZATION

Announcement has been made of the resignation of Robert M. Eames as vice president and general manager of The Bryant Electric Company, Bridgeport, Conn., one of the pioneer wiring device manufacturers in the industry. Mr. Eames was associated with The Bryant Electric Company for twenty-eight years, serving in various capacities, and was held in high esteem by his associates.

Harry E. Seim has assumed the general managership of The Bryant Electric Company, effective November 8, 1934. Mr. Seim is not new to the wiring device industry having been associated with The Bryant Electric Company for the past twenty years and until this change was Treasurer and auditor.

ILLUMINATION HANDBOOK SIMPLIFIES LIGHTING DATA

A new and simplified method of designing floodlighting installations, known as the "Lumens in the Beam" method, and a simpler method of presenting data for the design of interior lighting installations, features the new pocket-size illumination handbook which the Westinghouse Lamp Company has just announced.

In the floodlighting section of the new handbook is contained most of the data required to determine the size and number of floodlights necessary for any installation. The data is presented in tabular form, thus eliminating nearly all calculations. The required beam spreads of the floodlights are determined by a graphical method. The usual types of floodlighting installations which are encountered in everyday practice, such as in parking spaces, industrial yards, bulletin boards, and buildings,

may be designed according to these simplified methods, while the more complicated installations are left to the experienced lighting engineer. The section pertaining to the design of floodlighting installations contains five divisions and tables of data.

Complete information is provided on every phase of lighting design for the home, office, store and factory, this section of the handbook being divided into nine parts, with tables of illumination data.

Copies of the handbook may be obtained at 10 cents each from the Commercial Engineering Department of the Westinghouse Lamp Company, Bloomfield, N. J.

A 16-page illustrated booklet, "Bulletin No. 106," featuring all types of photographic studio lighting equipment including several new units lately placed on the market, has recently been published by Kliegl Bros., New York City. It gives a complete description of the various units, control features, applications, prices and other interesting details. A number of the units are suitable for other lighting applications as well as for photographic purposes.

General Cable Corporation, 420 Lexington Ave., New York City, has published two bulletins, one covering "AEIC" and armored types of service entrance cables, and the other covering asbestos insulated magnet wire.

The Arrow-Hart & Hegeman Electric Co., Hartford, Conn., has released its 58-page catalog "V" covering the complete "H & H" line of wiring devices. The company's staple wiring device lines are completely illustrated, and in addition a wide va-



Patented Features

Make Wilson The Fastest Seller



Do You Know?

that the reflectors used on this Three-Lite are individually adjustable to project the light exactly where needed. Complete with mounting brackets and colors, list \$7.25 and \$8.00. . . . that this weatherproof floodlight may be instantly relamped without removing the lens, list \$7.65. Both of these units have many other definite advantages. REMEMBER THIS: It is the superior design which makes the Wilson line easy to sell.



Watch for additions to the line of Wilson Original Products.

Write for new Condensed Catalog of our best selling Xmas items.

WILSON LIGHTING INC.

2337 N. Hoyne Ave.
CHICAGO



Ceiling or Corner Light

SHERMAN BAKELITE FIXTURE CONNECTOR

A
PIGTAIL JOINT
WITHOUT
SOLDER
OR TAPE



One size only takes any needed wire combination. Convenient in size—fits easily into smallest canopies—all wire held securely by screw wedged in "Vee" shaped opening. No metal parts to cause shorts.

SOLD
THROUGH
JOBBER



Send for Bulletin No. 18)

H. B. SHERMAN MFG. CO.
BATTLE CREEK, MICHIGAN

December New Products

Keyhole Finder

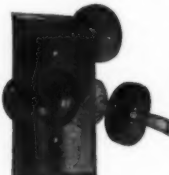
An ornamental brass door knocker which combines also a battery operated miniature lamp within the hammer is announced by the Knockerlite Co., Cleveland, Ohio. The "Knocker-Lite" lamp is



turned on whenever the knocker is raised, and while in this position a beam of light is thrown downward, which is claimed to be ample to illuminate the keyhole. This device requires two small batteries which will operate for considerable time before replacement becomes necessary. Installation is claimed to be a simple operation for anyone, being fastened in place with screws which are supplied with each complete unit. Five standard finishes are available.

Wiring Devices

A clock hanger outlet (Cat. No. 1534), a floor outlet (Cat. No. 1532), an outdoor flush receptacle (Cat. No. 1533) and a fan hanger outlet (Cat. No. 1535) have been announced by Pass & Seymour, Inc., Syracuse, N. Y. The clock hanger outlet has receptacle which is recessed for attachment plug cap, allow-



ing clock to hang flush with wall, and is supplied complete with .040 in. brush brass plate, and operates on 15 amp. 125 volts, 10 amp. 250 volts. Floor outlet (shown above) has recessed receptacle for use in floors, base boards, etc., and is furnished complete with two caps, one a cord hole cap for retaining attachment plug in receptacle and the other a protective flush screw cap which closes the outlet when device is not in use, and operates on 15 amp. 125 volts, 10 amp. 250 volts. Outdoor flush receptacle (shown above) for holiday lighting, portable lamps on verandas, etc., has plate and screw cover cadmium finished to prevent corrosion. Gaskets for both plate and screw cover make it weatherproof. Receptacle operates on 15 amp. 125 volts, 10 amp. 250 volts. Fan hanger outlet is clamp type for mounting on a standard 4 in. square outlet box and cover with raised rectangular opening.



Automatic Control Switches

The Tork Clock Co., Mount Vernon, N. Y., is now manufacturing a line of automatic control switches made in 5, 15 and 20 amp., single and double pole capacities without housings. The mechanisms are driven by self-starting sub-synchronous motors for use on a.c. lines. Switches are made with either 24 hour dials for daily service or with 60 minute dials for a more rapid and continuous operation at short intervals. A wide variation in time settings are available and the 24 hour models may be set to automatically skip certain days each week if desirable. Both mercury tubes or pure silver contacts are used depending upon the class of service. Manufacturer also claims that switches have freedom of hand operation without interruption to any automatic sequences with free wheeling clutch enabling the user to change dial without loosening any parts. Switches may also be installed in the hand wound models made several years ago without disturbing present connections.

Lamp Guard

A line of hook handle portable lamp guards known as their 600 series has been announced by McGill Manufacturing Co., Valparaiso, Ind. A large hook is provided at the socket end of this device which provides convenient facilities for hooking on bench tops, over large pipes, between joints, cracks and other places where the smaller hook, which is also retained as a part of the guard, would not suffice. The wide curve of the larger hook is made possible by providing an offset type cord connection for the socket. Additional features announced for this series include a clamp fastener of the double screw-type for cord strain relief, and an increase in thickness of the soft oil-resistant rub-



ber socket holders that also serve as handles for these portable guards. This series is available in 12 styles, ranging from 25 to 100 watt lamp sizes, with keyless or levolver socket levers. Guards are made in open or closed cage, and closed cage with reflector types. Certain numbers can be supplied with grounding attachments at additional cost. Lengths range from 10 1/4 in. for the 25-watt size to 14 1/4 in. for the 100-watt size.

Handitorch

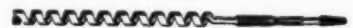
An automatic pressure torch with a standard type flame control and shut-off valve having a needle point which automatically cleans the gas orifice each time the bakelite handle is closed has been announced by The Turner Brass Works,



Sycamore, Ill. The No. 5 handitorch, which uses alcohol, is quickly generated from the heavy brass asbestos-filled drip cup and develops a strong blue blast flame which can be pointed in any direction. The polished nickel tank is made of seamless drawn brass with a concave (funnel) bottom for easy filling. Unit is 6 in. high, 3 in. diameter at base, and has a tank capacity of 1/2 pt. The unit is also made to use gasoline, and is known as No. 4.

Convertible Shank Augers

A line of ship augers with shanks which may be easily cut off at the desired point and adapted to bit brace, electric drill chuck, or auger handles or may be lengthened for extension use by welding on additional rod is announced by the Irwin Auger Bit Co., Wilmington,



Ohio. The Irwin 4-way shank ship auger is made in two styles, each in 18 sizes ranging in sixteenths of an inch from 3/8 in. to and including 2 in., with an average overall length of 18 in. and an average length of twist of 12 in. Heat-treated molybdenum alloy tool steel is used which is claimed to provide more lasting sharpness, while the shank is left soft at the points where it may be desired to cut off the upper end with a hacksaw. A spring temper is claimed to assure true boring without bending or distortion. A section of the shank is grooved and machined for the 3-jaw chuck on electric drills, and for the set-screw chuck on air drills.

Electrical Contracting, December, 1934

riety of specialties including illuminated home numbers, diffused aisle lights, fan and clock hanger outlets, polarized range outlets, and multicoupler antenna systems for wired radio. Six pages of wiring diagrams are interspersed within the various sections of this catalog, while a 14-page combination index and price-list supplement is attached to the general listing pages.

Pittsburgh Reflector Company, Pittsburgh, Pa. has available for distribution a series of data covering its line of products as follows:

Thirty-six page catalog No. 36, entitled "Permaflexor Lighting", listing the various types of window reflectors, window floods and accessories; a 12-page bulletin "Permaflexor Luminaires", listing indirect commercial units; "Permaflexor Floodlights", listing its line of flood-lighting units, together with descriptive mounting and engineering data, and "The Silent Partner", a 10½ in. by 13½ in., 16-page handsomely illustrated series of before and after views of outstanding commercial lighting installations.

A 12-page booklet entitled "The Other Entrance to Your Home" has been prepared by the Square D Company, Detroit, Mich., for general distribution to the home owner. This booklet is arranged in plain lay terms which are accompanied by illustrations explaining the advantages of safe and adequate service entrance equipment for homes. Copies are available to the electrical contractor for his use in the solicitation of modernization work.

A 4-page illustrated bulletin entitled "Indestructo Rubber Sheathed Cables" has been published by National Electric Products Corp., Pittsburgh, Pa.

Allen-Bradley Company, Milwaukee, Wis., announces the appointment of Frank J. Connolly as sales engineer for its New York office, located at 50 Church St., New York City.

General Electric Company, Schenectady, N. Y., has released Catalog No. GEA-602D, "Electric Instruments." This catalog has 162 pages of listed material, together with a seven page index devoted to a com-

plete listing, together with illustrations, of round pattern, horizontal edgewise and rectangular switch-board instruments; small panel instruments; portable instruments and accessories; shunts for direct current instruments; strip-chart recording instruments; laboratory standard equipment; oscillographs; potentiometers and Epstein testing equipment.

Ideal Commutator Dresser Co., Sycamore, Ill., announces that M. A. Buettell, formerly with the Dodge Manufacturing Corporation, has joined the company as electrical engineer.

Tobe Deutschmann Corp., Filterette Division, Canton, Mass., has published a 4-page bulletin designated as ECL-834 describing Model 233 noise and fault locator.

Van Cleef Bros., Chicago, Ill., announces the resignation of Herman A. Wronker, effective December 1, 1934. Mr. Wronker was division sales manager in charge of the firm's southeastern territory. He will be replaced by George Bills.

H. G. Goble, who has been with Van Cleef Bros. for a number of years, and had charge of the firm's World's Fair Exhibit, has joined the sales organization and he will call on the trade in cities adjacent to Chicago and parts of Michigan, Illinois and Indiana.

Proposal Wanted

Jackson, Michigan.

NOTICE TO CONTRACTORS:

Sealed proposals will be received by the City Commission of the City of Jackson, Michigan, at the office of the City Manager, up to 10 o'clock A. M., Eastern Standard Time, of December 20, 1934, for the construction of a Complete 4800 Volt Primary Installation, which is a Non-Federal P.W.A. Project, consisting of the following quantities, 3-333 K.V.A. Transformers—Busses—Pipe Frame work Transformer, Platform and supports—Fencing and Fence supports.

The plans and specifications under which the work is to be done may be examined at the office of the City Clerk or of the City Electrician at Jackson, and copies may be obtained for bidding purposes by making a deposit of Five Dollars, which will be refunded upon their return in good condition within ten days after the date of receiving proposals.

Attention is called to the fact that not less than the minimum wage rates prescribed by the Federal Emergency Administration of Public Works must be paid on this project.

A certified check in an amount equal to five percent of the total amount of the proposal will be required.

No bid will be considered unless accompanied by the bidder's Certificate of Compliance, U.S. Government Form P.W.A. 61, Revised March, 1934, to the effect that the bidder is complying with and will continue to comply with each applicable code of fair competition, or in the absence of such code or codes, with the President's Reemployment Agreement. Copies of this certificate will be included with the "Instructions to Bidders."

The right to accept any proposal, to reject any or all proposals and to waive defects in proposals, is reserved by the city.

P. E. CAMPBELL,
City Manager.



For Residence Wiring

The Best and Safest Method is a properly installed KNOB and TUBE job. Be sure and get the

Bull Dog
REGISTERED

Assembled Knob because it "HAS A GRIP LIKE ITS NAMESAKE."

ILLINOIS ELECTRIC PORCELAIN CO.
MACOMB, ILLINOIS



BURNDY

QIKLUG

No Solder!

Installed in a minute with only a wrench

BURNDY

ENGINEERING CO., INC.

305 EAST 45TH STREET, NEW YORK

Agents Everywhere

MINERALLAC



Cable or Conduit Hanger



Jiffy Clip



Statiscopes

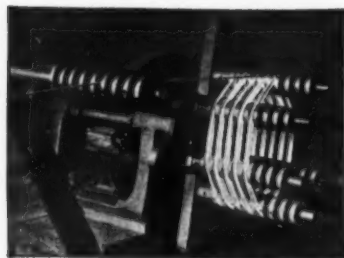
Write for Literature

MINERALLAC ELECTRIC CO.
25 No. Peoria Street, Chicago, Ill.

New York City Branch
381 Fourth Avenue

IDEAL COIL WINDER HEAD

... lowers coil cost



LOW COST—ADJUSTABLE

Quickly set for various sized diamond or mush, loops, round, square or rectangular coils. Eliminates cost, delay and storage of special coil forms. Particularly adapted for from 1 to 50 H/P motors—maintenance or production work. Speed operation—set of 48 diamond coils made in from 30 to 45 minutes, typical. No solid side walls—coil may be tape laced while still on head. Face plate fits any turning device or can be SWUNG on larger lathes. Send the coupon today for literature or for 10-DAY FREE TRIAL.

IDEAL COMMUTATOR DRESSER CO.
1041 Park Avenue, Syosset, Ill.

Gentlemen: Please send us

- ☐ IDEAL Coil Winder Head on 10-Day Trial.
☐ Literature and low prices.

Name
Address
City..... State..... (1234)

Advertisers' Index

A
Allen-Bradley Co. 21
Arrow-Hart & Hegeman Electric Co.,
The 28

B
Bryant Electric Co., The..... 33
Bulldog Electric Products Co..... 31
Burdny Engineering Co., Inc..... 43

C
Chicago Electrode Laboratories..... 44
Chicago Expansion Bolt Co..... 44

F
Fretz-Moon Tube Co..... 32
Fullman Mfg. Co..... 44

G
General Electric Company.....
.....Inside Front Cover, Back Cover
Graybar Electric Company..... 4
Greenlee Tool Co..... 34

I
Ideal Commutator Dresser Co..... 44
Illinois Electric Porcelain Co..... 43

J
Jefferson Electric Company..... 25

K
Kliegl Bros. 39

M
McGill Manufacturing Co..... 39
Minerallac Electric Company..... 44

N
National Electric Products Corpora-
tionFront Cover

R
RCA Victor Company, Inc..... 2

S
Sherman Mfg. Co., H. B..... 41
Square D Company...Inside Back Cover
Standard Transformer Co..... 44
Steel and Tubes, Inc.....22-23
Stromberg Electric Company..... 24

T
Trumbull Electric Mfg. Co., The.... 37

U
United States Rubber Co..... 35

W
Wilson Lighting, Inc..... 41
Wiremold Company, The..... 29

Y
Youngstown Sheet and Tube Com-
pany, The 27

Free to Electrical Contractors

"Questions
and
Answers"
by
R.A. WARREN

R. A. Warren's booklet
answering 18 perplexing
questions on Neon Sign
installation and opera-
tion.

Write for Free Booklet and suggestive plant
outlays. You will be surprised at the small
investment necessary to increase your total
sales materially.

Chicago Electrode Laboratories
Dept. A-3 St. Charles, Ill.

Increase Your Profits

and be sure of permanent anchorage
of Conduit to Masonry or Concrete

USE **CHICAGO**
EXPANSION HOOK BOLTS

Costs you half of what
other methods cost and
saves time on the job. No
other fittings required.
Made in sizes from 1/2"
to 1 1/2".



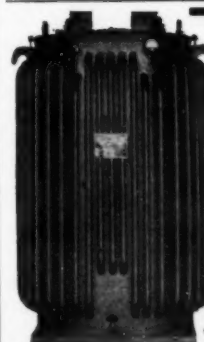
Send for samples and attractive prices

CHICAGO EXPANSION BOLT CO.
128 S. Clinton St. Chicago, U. S. A.

SPECIFY "Latrobe"

FLOOR BOXES—ACCESSORIES
"BULL DOG" INSULATOR SUPPORTS
"KEYSTONE" FISHWIRE
CONDUIT BENDERS

All manufactured by Fullman
Mfg. Co. and carried in stock
by over 300 jobbers—Send for
Catalog No. 225.
FULLMAN MFG. CO. - LATROBE, PA.



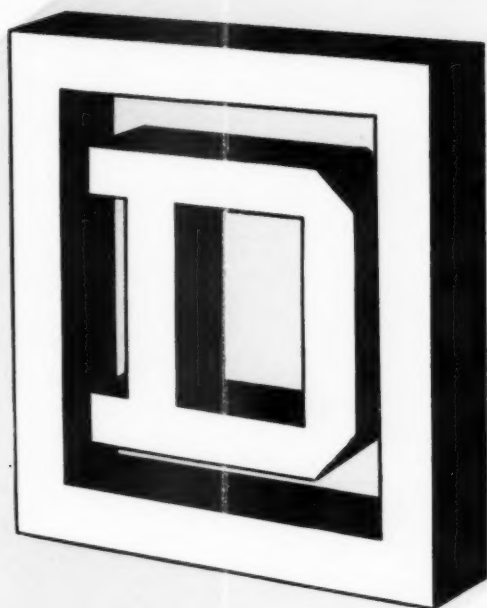
"Standardize on
STANDARD
Transformers"

ALL TYPES
Indoor and
Outdoor
Service

Send for
Descriptive
Bulletin

STANDARD TRANSFORMER CO.
Warren Ohio

The Square D "50,000 SERIES" industrial safety switch. Compact design but large wiring space. Front operation. Positive pressure fuse clips and jaws. Built in sizes from 30 to 200 amperes.



SQUARE D SAFETY SWITCHES



SQUARE D COMPANY

DETROIT, MICHIGAN, U.S.A. MILWAUKEE, WISCONSIN
 SQUARE D COMPANY, INC., LOS ANGELES, CALIFORNIA
 SQUARE D COMPANY CANADA LTD., TORONTO, ONTARIO



USE G-E WIRING MATERIALS IN ALL MODERNIZATION WORK

Everywhere, people are taking advantage of the opportunity afforded by FHA to modernize their homes. In most of these homes, and in other types of buildings too, the wiring systems are inadequate, inefficient . . . even unsafe. Get your share of this modernization work. Use G-E Wiring Materials exclusively. The General Electric line of wiring materials is complete. Their

quality guarantees maximum safety, efficiency, convenience. They are easy for you to install. G-E Wiring Materials make jobs profitable for you . . . and your customers. For complete information and for special FHA bulletins, see your G-E Merchandise Distributor or write Section CDW-1912, Merchandise Department, General Electric Company, Bridgeport, Connecticut.

GENERAL ELECTRIC

WIRING MATERIALS

MERCHANDISE DEPARTMENT, GENERAL ELECTRIC COMPANY, BRIDGEPORT, CONNECTICUT

